ENVIRONMENTAL ASSESSMENT

IMPROVING THE RECREATIONAL FISHERY ON MALMSTROM AIR FORCE BASE

Prepared For:
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Malmstrom Air Force Base
Great Falls, Montana 59402

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FINDING OF NO SIGNIFICANT IMPACT

NAME OF THE PROPOSED ACTION

Improving the Recreational Fishery on Malmstrom Air Force Base

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The Proposed Action is to improve recreational fishing opportunities on Malmstrom Air Force Base (AFB) by managing undesirable fish species in the existing pond and through creating an additional pond. This action would not only allow for continued use of the only fishery on Malmstrom AFB while constructing another pond takes place, but also addresses the desire to control the number of goldfish in Pow Wow Pond. The action would be a cooperative effort between the USAF and USFWS. The USFWS would provide assistance with obtaining and stocking a preferred predatory fish species capable of controlling or eradicating undesirable fish inhabiting Pow Wow Pond. Fifty adult sized largemouth bass would be stocked annually for two years. It is anticipated that this size of bass would prey on the undesirable goldfish population while allowing stocked rainbow and brown trout to grow and be caught by anglers. By stocking a combination of trout and bass, the recreational fishery would be enhanced by providing a variety of fish to catch and quickly establish measures to control undesirable fish species. Constructing another pond would increase the total acres of fishable water and double the number of fishing ponds available. And by attaching a new pond to Pow Wow Pond, various biological and physical attributes would be utilized more efficiently than by building a pond elsewhere on Malmstrom AFB. The Proposed Action also includes the option (Alternative C) to use a chemical fish toxicant to control undesirable fish species if monitoring shows predatory fish are not effective.

Under the No Action Alternative, no effort would be taken to control undesirable fish species, nor to increase the number of fishable acres available to Base families. Undesirable fish would likely continue to survive and reproduce in the pond, thereby reducing the current and future quality of a fishing experience. Other alternatives to the Proposed Action (*Alternative E*) were determined unsuitable and were removed from consideration as they failed to increase recreational fishing opportunities while addressing undesirable fish issues. *Alternative B* (Drain Pow Wow Pond to eliminate undesirable fish and restock with preferred species of fish) was dropped from further consideration because of the difficulty of keeping the pond completely dry for an extended period of time, the uncertainty of refill in a timely manner, and the potential adverse effects to the associated wildlife community. *Alternative C* (Remove undesirable fish through use of a chemical fish toxicant) was dropped from consideration because it failed to provide families a place to fish from while additional ponds were being constructed elsewhere and for concern for the health of the aquatic community present in Pow Wow Pond. *Alternative D* (Control undesirable fish in Pow Wow Pond through introduction of a predatory fish) was dropped from consideration because the amount of fishable waters on Malmstrom AFB would not increase above its current size. *Alternative F* (Control undesirable fish in Pow Wow Pond

through introduction of a predatory fish and build a new pond near the traffic circle in the Outfall 1 detention pond) was dropped from consideration because creating a new pond would require an extended period of time and effort to establish a functioning aquatic system prior to stocking a new fish community as well as costs incurred with duplicating recreational amenities in 2 locations on Malmstrom AFB.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

The Environmental Assessment (EA) provides an analysis of the potential environmental consequences associated with the Proposed Action and No Action Alternative. Resource categories were analyzed to identify potential environmental impacts. Based on this evaluation, the Proposed Action would not result in significant impacts to any resource area. The No Action Alternative, while resulting in no impact, would not achieve the desired goal of improving recreational fishing opportunities on Malmstrom AFB.

Chapter 4 of the EA provides a comparison of the Proposed Action and No Action Alternative. Under the Proposed Action, air, water, and land resources would be temporarily impacted by constructing another pond. However, any potential impacts would be short-term and limited to the localized area surrounding the building site. Increased risk to health and safety, mainly to construction workers through inhalation of air borne dust particles and equipment operation, would be mitigated by adhering to recommended safety standards and best management practices. Construction waste would be managed in accordance with Montana solid and hazardous waste management requirements and the Clean Water Act. There would be a minor increase in noise generated during pond construction of the impoundment, installing soil containment structures, and replanting vegetation on exposed soil surfaces. This impact would be minor and temporary in nature so that no significant impact should result. Surface water would be managed in accordance with the Montana Department of Environmental Quality (DEQ) storm water program and Malmstrom AFB Storm Water Pollution Prevention Plan. The area would be closed off to public access, signed and monitored by the USAF until deemed suitable for public use.

The current fish community would be impacted by adding another sport fish; however largemouth bass would prey primarily on the goldfish presently inhabiting Pow Wow Pond. By reducing or eliminating this undesirable fish, the quality of the remaining fishery (bass, rainbow and brown trout) would improve. Pow Wow Pond's aquatic system would also improve, since goldfish feeding behavior has likely contributed to the poor water quality observed over the past three years. Impacts to surrounding surface and ground water, wildlife habitat areas, or threatened or endangered species or their habitat are expected to be minor to none. Thus, in the long-term the Proposed Action will have a beneficial effect on the biological resources and recreational fishing opportunities of the area.

CONCLUSION

In accordance with the Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA), as amended, and the Air Force Environmental

Impact Analysis Process regulations contained in 32 Code of Federal Regulations (CFR) 989, an assessment of the environmental effects has been completed for improving the recreational fishery at Malmstrom AFB. I have determined that the Proposed Action will not have a significant adverse impact on the environment or the quality of the human environment. Therefore, an Environmental Impact Statement is not required.

Robert W. Stanley II

ROBERT W. STANLEY II, Colonel, USAF
Malmstrom AFB, ESOH Council Chairman

10 July 2011

DATE

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EXECUTIVE SUMMARY

The United States Air Force (USAF) with assistance from the United States Fish and Wildlife Service (USFWS) proposes to improve recreational fishing opportunities on Malmstrom Air Force Base (AFB) by managing undesirable fish species in the existing pond and through creating one or more additional ponds. Control of these undesirable fish is necessary to allow the best chance for growth and survival of the trout fishery currently inhabiting Pow Wow Pond. Creating an additional pond would not only double the number of fishing opportunities and increase the fishable acreage available for families, but also allow for one fishery to be improved while still providing another for families to enjoy.

The Air Force is required by the National Environmental Policy Act (NEPA) to analyze the potential effects of its proposed actions. This document describes the applicable laws, affected environment, and potential direct, indirect, and cumulative effects of the Proposed Action and No Action alternative. The document fulfills the requirements of NEPA, Air Force Regulations, and all applicable laws and regulations.

Pow Wow Park is a recreational site located in the east central area of Malmstrom AFB. The Park's pond is the largest water impoundment on the Air Force Base, is approximately 1.7 acres in size, and contains the only recreational fishery for personnel and their families to enjoy. Under the Preferred Alternative, a predatory fish species would be stocked in order to control undesirable fish currently inhabiting the pond. In addition to preying on goldfish, the preferred species (largemouth bass) would provide an enjoyable fishing experience by diversifying this pond's fishery. The Proposed Action also includes the option to use a chemical fish toxicant to control undesirable fish species if monitoring shows predatory fish are not effective.

The Proposed Action also calls for creating a pond adjacent to the existing pond thereby taking advantage of existing facilities and an available water supply to fill the new pond. During construction all recommended safety standards would be followed and equipment utilized to minimize impacts to humans and the environment. Increased risk to health and safety, mainly to construction workers, would be mitigated by best management practices (BMPs). During pond construction, the area would be signed and closed off to access until deemed acceptable for public use.

Direct impacts of the Proposed Action to the biological integrity of Pow Wow Pond include stocking a new fish species to control and/or eradicate undesirable fish and improving its water quality. New pond construction would create short-term impacts to localized air quality, water and geological resources, and land use in an area. These impacts to surrounding surface and ground water, habitat areas, threatened or endangered species, or their habitat are expected to be minor to none from the Proposed Action; therefore, no major mitigation measures are required or proposed. However, measures are proposed to mitigate possible adverse short-term impacts. In the long-term, the Proposed Action would have a beneficial effect on the recreational fishery of Malmstrom AFB by providing families with access to a variety of fishes to fish for in multiple waters. No significant cumulative effects were likely as a result of any of the alternatives.

1.0 PURPOSE AND NEED FOR PROPOSED ACTION

1.1 INTRODUCTION

The United States Air Force (USAF) with assistance from the United States Fish and Wildlife Service (USFWS) proposes to improve recreational fishing opportunities on Malmstrom Air Force Base (AFB) by managing undesirable fish species in the existing pond and through the creation of one or more additional ponds.

Currently, the only recreational fishing opportunity for personnel and their families exists in Pow Wow Pond. It is stocked once a year with 250 catchable size rainbow trout (*Oncorhynchus mykiss*) from the U.S. Fish and Wildlife Service's Creston National Fish Hatchery in Kalispell, Montana and with an additional number of larger rainbows in support of the annual youth fishing day. Three hundred juvenile brown trout (*Salmo trutta*) from the Montana Fish, Wildlife and Parks State Fish Hatchery in Lewistown, Montana are also stocked annually to diversify its fishery and assist in controlling undesirable fish species.

Over the past years, Malmstrom AFB personnel have proposed numerous improvements to the Pow Wow Park recreational area, including site work and equipment installations to enhance fish and wildlife habitat, wildlife viewing, and fishing opportunities. Recommendations were solicited from the US Fish and Wildlife Service's Montana Fish and Wildlife Conservation Office (FWCO) as well as various contractors. Proposed physical improvements such as adding wind breaks by planting vegetation, shrubs, and trees, bank and shore stabilization, adding an aeration system to improve water quality for fish habitat, and the installation of an irrigation system to improve wildlife habitat were all accomplished in recent years. Discussions between Malmstrom AFB and FWCO continue as to the ideal species of fish to stock, given limitations to the currently available water body.

1.2 Purpose

The purpose of this action is to improve recreational fishing opportunities by stocking existing or future ponds, with a variety of fish species that not only provide an enjoyable fishing experience but also control undesirable fish that are illegally dumped into a pond. As mentioned above, Pow Wow Pond is a relatively small impoundment and despite recent improvements, it still provides limited space for the number of anglers using the area. Pond size also determines the species of fish and the number of them that can be stocked. Any negative impact to this pond's water quality or its fishery, jeopardizes its ability to provide a pleasant experience for families.

Some time prior to 2005, goldfish (*Carassius auratus*) were discovered in Pow Wow Pond and their numbers increased to the point where they affected the health of the sport fish being stocked. While the 2005 effort to eradicate goldfish from Pow Wow Pond was deemed a success (USFWS 2007) and visible improvements to the ponds aquatic system and fish health were observed afterwards; efforts to prevent the reintroduction of this same fish failed. Thus the goldfish population has returned to pre-treatment numbers since the chemical removal performed in 2005 under a previous EA (USFWS 2004). The source of the goldfish remains unknown, but is thought to be the result of dumping the contents of a home aquarium into the pond. Control or eradication of undesirable fish, such as goldfish, is part of the Proposed Action to improve this recreational fishery.

Additionally, the Proposed Action includes building another pond and stocking it with fish. Besides doubling the number of opportunities and increasing fishable acreage available for families, it would also allow for one fishery to be improved while still providing another for families to enjoy.

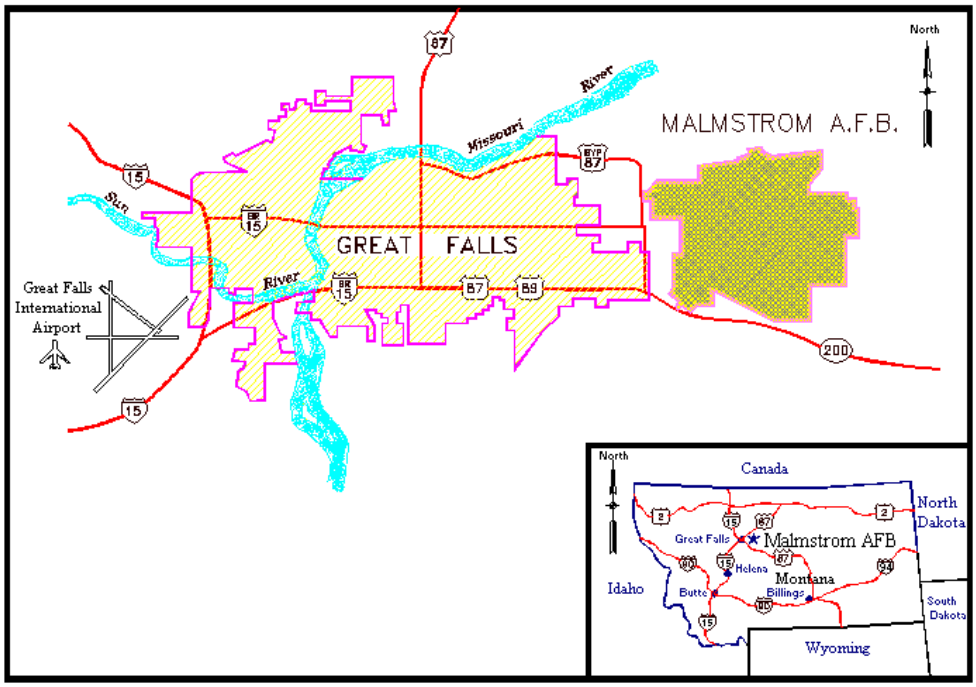
1.3 Project Location and Setting

Malmstrom AFB encompasses over 3,600 acres of land in Cascade County, in north central Montana. The City of Great Falls lies approximately 0.4 miles to the west of the Base at its closest point (Figure 1). The Missouri River is located approximately 0.9 miles north of the Base and flows easterly. Interstate Highway 15 passes through Great Falls and access to the Base is provided from Highway 87/89. Land uses on Malmstrom AFB include an Airfield, Aircraft Operations and Management, Industrial, Administrative, Medical, Personnel Housing, Community Commercial, Community Service, and Outdoor Recreation (Hydrometrics 2003). Land use in the vicinity of Malmstrom AFB is predominantly rural - agriculture. Agriculture and rangelands extend for miles to the north, east, and south; with the foothills of the Little Belt Mountains and Highwood Mountains lying further south and east, respectively.

Malmstrom AFB lies in the shortgrass prairie region, at an elevation of 3500 ft (1,068 m) above sea level. This is the most arid region of the mid-continental grasslands with annual precipitation averaging 15 inches. The topography and drainage of the area has been significantly altered since establishment in 1942. Most native vegetation within developed areas of Malmstrom AFB has been altered by the introduction of exotic vegetation. Surface water sources are limited to

Figure 1. Malmstrom Air Force Base lies east of Great Falls, Montana.

storm water runoff, ground water from facility dewatering, and irrigation water runoff. Three



man-made impoundments on Malmstrom AFB collect a portion of this runoff: Pow Wow Pond and the two small ponds near the Central Heat Plant. However, these smaller ponds do not support fish and are located in a restricted area.

Originally constructed in the mid-1960's, Pow Wow Park facilities have been upgraded to include a gazebo picnic area, outdoor picnic tables, barbeque grills, toilets, horseshoe pits, a baseball field, and mowed play areas. The area surrounding the pond has had a surfaced trail created and a shelter belt of trees and shrubs planted, all designed to improve human access and protect the pond's water quality. These features have enhanced the areas overall appearance and continue to attract personnel and their families.

Figure 2. A map of Malmstrom AFB, showing existing ponds and the locations for new ponds under the Proposed Action (Alternatives E) and Alternative F.

1.4 SCOPE OF THE ENVIRONMENTAL REVIEW

The USAF and USFWS cooperatively prepared this Environmental Assessment (EA). The EA was prepared in accordance with the National Environmental Policy Act (NEPA), 40 CFR 1500-1508, and Air Force procedures for implementing NEPA found in 32 CFR 989, the Environmental Impact Analysis Process.

Under this guidance, the EA shall provide sufficient evidence and analysis for the decision-maker to determine whether to prepare an Environmental Impact Statement or prepare and sign a Finding of No Significant Impact (FONSI). The EA is not a decision document, but rather discloses the potential environmental consequences of implementing the Proposed Action or any alternative.

The EA evaluates/assesses impacts to the environment from the following alternatives:

Alternative A: No action.

Alternative B: Drain Pow Wow Pond to eliminate undesirable fish and restock with preferred fish species.

Alternative C: Remove undesirable fish through use of a chemical fish toxicant.

Alternative D: Control undesirable fish in Pow Wow Pond through introduction of a predatory fish.

Alternative E: Control undesirable fish in Pow Wow Pond through introduction. of a predatory fish and build a new pond adjacent to Pow Wow Pond.

Alternative F: Control undesirable fish in Pow Wow Pond through introduction of a predatory fish and build a new pond near the traffic circle in the Outfall 1 detention pond.

1.4.1 Public Involvement

Evaluation of this project will be conducted by the USAF. Issues were determined by USAF staff based on the nature, location, and magnitude of the project. As required by NEPA, a public comment period will be scheduled and conducted. The Draft EA will be mailed using a mailing list developed by Malmstrom AFB personnel. Notices will also be published in the Great Falls Tribune. Comments will be accepted from both the public and government agencies through written correspondence.

1.5 APPLICABLE REGULATORY REQUIREMENTS

1.5.1 Air Quality

The Montana Clean Air Act (Montana Code Annotated, Title 75, Chapter 2) essentially implements the Federal Clean Air Act. The Montana Clean Air Act, implemented by the Air Quality Procedural Regulations, the Air Quality Regulations, and the Ambient Air Quality Standards, establish ambient air quality standards and permitting and monitoring procedures.

1.5.2 Water Quality

The Federal Water Pollution Control Act, commonly referred to as the Clean Water Act (CWA), restores and maintains the chemical, physical, and biological integrity of the nation's waters by preventing point and nonpoint pollution sources, providing assistance to publicly owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands. Section 404 of the Clean Water Act (CWA) regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Activities in waters of the United States regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports) and mining projects.

The Montana Water Quality Act (Montana Code Annotated, Title 75, Chapter 5) sets forth water conservation, water quality protection, and pollution prevention and abatement measures. Implementing regulations include the Water Pollution Control Regulations (Administrative Rule of Montana [ARM], Title 16, Chapter 20, Sub-chapter 7). Montana Pollutant Discharge Elimination System Rules (ARM, Title 16, Chapter 20) establish effluent limitations, treatment standards, and other requirements for point source discharge of waste into State waters.

The Groundwater Pollution Control Regulations (ARM, Title 16, Chapter 20) establish groundwater classification, and set forth protection and permitting requirements, while the Surface Water Quality Standards (ARM, Title 16, Chapter 20, Sub-chapter 6) establish surface water quality criteria to ensure public health and safety and provide for water conservation.

The Montana Stream Protection Act (Montana Code Annotated, Title 87, Chapter 5) establishes protection criteria for streams and permitting requirements from projects that may effect the bed or banks of any stream in Montana.

1.5.3 Public Health and Safety/Hazardous Waste

The U.S. Environmental Protection Agency (EPA) approved the use of rotenone after significant research on its potential effects on public health. When applied according to label instructions,

the use of rotenone for fish control does not present a risk of unreasonable adverse effects to humans or the environment. Hazards associated with drinking water treated with rotenone are small if low concentrations (0.25 parts per million, maximum) are used.

Rotenone is a naturally occurring substance extracted from roots of a tropical plant that rapidly breaks down in the environment. Product label recommendations state, "do not swim in rotenone-treated water until the application has been completed and all the pesticide has been thoroughly mixed into the water according to labeling instructions." EPA does not have guidelines for consumption of fish that have been killed by rotenone. However, due to the high risk of salmonella and other bacterial poisoning from fish that have been dead for a period of time, this practice is not allowed. A specimen label and material safety data sheet for the rotenone product, if used, are found in Appendix E.

The Montana Solid Waste Management Act (Montana Code Annotated, Title 75, Chapter 10) provides for coordinated State solid waste management and a resource recovery plan, waste reduction, and recycling programs.

The Hazardous Waste and Underground Storage Tank Act (Montana Code Annotated, Title 75, Chapter 10), and the Hazardous Waste Management Regulations (ARM, Title 16, Chapter 44) control the generation, storage, transportation, treatment, and disposal of hazardous wastes. The Act also authorizes the State to implement a program pursuant to the Federal Resource Conservation and Recovery Act (RCRA).

The Refuse Disposal Rules (ARM, Title 16, Chapter 14, Sub-Chapter 5) implement the Hazardous Waste Act and Regulations. These regulations provide uniform standards for the storage, treatment, recycling, recovery, and disposal of solid waste (including hazardous waste), and transportation of hazardous waste.

1.5.4 Biological Resources

The Endangered Species Act (16 USC 1531-1543) requires federal agencies to ensure that any actions they authorize, fund, or carry out, do not jeopardize the continued existence of endangered or threatened species or destroy or adversely modify their critical habitat. Federal agencies must evaluate the effects of their actions on endangered or threatened species of fish, wildlife, and plants and their critical habitats and take steps to conserve and protect these species. The Endangered Species Act requires the avoidance or mitigation of all potentially adverse impacts to endangered and threatened species.

Executive Order (EO) 11990, Protection of Wetlands, requires federal agencies to take action to avoid (to the extent practicable) the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. The intent of EO 11990 is to avoid direct and/or indirect effects from construction in wetlands if a feasible alternative is available. All federal and federally supported activities and projects must comply with EO 11990. Executive Order (EO) 13112, Invasive Species, requires federal agencies to take action to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species can cause. The intent of EO 13112 is to take appropriate control measures to eradicate, suppress, reduce, or manage populations of invasive species from areas where they are present and prevent further invasions.

1.5.5 Cultural, Paleontological, and Archaeological Resources

The primary goal of the National Historic Preservation Act (NHPA) of 1966 (16 USC 470 et seq., as amended) is to ensure adequate consideration of the values of historic properties in carrying out federal activities and attempt to identify and mitigate impacts to significant historic properties. The NHPA is the principal authority used to protect historic properties. Federal agencies must determine the effect of their actions on cultural resources and take certain steps to ensure they locate, identify, evaluate, and protect all resources. In addition, 36 CFR 800 defines the responsibilities of the State, the Federal Government, and the Advisory Counsel on Historic Preservation (ACHP) in protecting historic properties identified in a project area. It (36 CFR 60) also establishes the National Register of Historic Places (NRHP) and defines the criteria for evaluating eligibility of cultural resources to the NRHP.

The Archaeological Resources Act of 1979 (16 USC 470a-47011, as amended) protects archaeological resources on federal lands. This Act requires permits for excavating and removing any archaeological resources should they be discovered by an agency during site activities.

2.0 DESCRIPTION OF PROPOSE ACTION AND ALTERNATIVES

This section addresses the alternatives, including those that are practical or feasible from a technical and economic standpoint and support the underlying purpose and need for the Proposed Action, based on the definition of reasonable alternatives and the selection criteria.

2.1 SELECTION CRITERIA

Criteria used to select an alternative were based on the specific needs of the USAF, the desired results of improving the recreational fishery on Malmstrom AFB, environmental factors, and budget constraints. Selection criteria are outlined below.

Criteria

1. The selected alternative must be cost effective.
2. The selected alternative must result in completion of the desired objective - measurable improvement to the recreational fishery on Malmstrom AFB.
3. The selected alternative must be compliant with Malmstrom AFB requirements for waste management, security, and environmental protection.

The USAF proposes to improve recreational fishing opportunities on Malmstrom Air Force Base by introducing a predatory fish into Pow Wow Pond or use a chemical fish toxicant to control undesirable fish species and construct a new pond adjacent to Pow Wow Pond. Impacts to the environment were evaluated for each alternative carried forward. Expected impacts from the No Action Alternative would be insignificant or none. Existing conditions and expected impacts are discussed in Sections 3 and 4 of this document; respectively.

2.2 Proposed Action (Alternative E)

Based on evaluations of the current fishery, improvements to the recreational fishery would best be attained by stocking a large predatory fish into Pow Wow Pond and construct another pond. The Proposed Action not only allows for continued use of the only fishery on Malmstrom AFB while new pond construction takes place, but also addresses desires to control the number of goldfish in Pow Wow Pond as well. Upon completion, this action would show measurable improvements to the fishery by providing angling access to a variety of fishes, control undesirable fish species in the existing pond, and increase the total acres of fishable waters. If post stocking monitoring shows that predatory fish are unable to control undesirable species, a chemical fish toxicant would be used as described in Alternative C.

This action would be a cooperative effort between the USAF and USFWS. The USFWS would provide assistance with obtaining and stocking a fish species capable of controlling or eliminating undesirable fish species like goldfish inhabiting Pow Wow Pond and the proposed new pond.

2.2.1 Site Location for New Pond - The Proposed Action calls for constructing a new pond in the area lying to the east of Pow Wow Park (Figure 2). By complexing ponds in this area, water

supplying Pow Wow Pond would be used to fill the proposed pond in the lower area next to the existing pond. The outlet structure of Pow Wow Pond can convey water through a series of ditches towards the lower area where this new pond would be located. Existing roads would be used to transport construction materials and one road could possibly serve as the base for the impoundment dam. Structures already in place near the center of the proposed impoundment may be redesigned to function as an outlet for excess water during high runoff events. A photograph of the proposed location for this new pond is provided in Appendix A.

Additional advantages exist for connecting a new pond adjacent to Pow Wow Pond. Portions of the aquatic life present in the existing pond would be transported through the proposed connected water way to populate the new pond. Not only would zooplankton and macro-invertebrates readily populate the lower pond, but crayfish could also migrate there. This transfer of aquatic organisms would form a food base for the fish community. This waterway could also provide the same migratory path for some of the predatory fish selected to control or eliminate undesirable fish within Pow Wow Pond.

Locating the proposed pond in the general area of Pow Wow Pond may also simplify security and management concerns. By complexing its outdoor recreational area and fishery at one location, Malmstrom AFB would save costs associated with constructing additional services such as a gazebo, outdoor picnic tables, barbeque grills, toilets, etc, at a new pond location.

2.2.2 Waste and Storm Water Management - Waste would be managed in accordance with Montana solid and hazardous waste management requirements and the Clean Water Act. Surface water would be managed in accordance with the Montana Department of Environmental Quality (DEQ) storm water program and Malmstrom AFB Storm Water Pollution Prevention Plan (MAFB 1996).

2.2.3 Fish Stocking – Currently, the stocking program consists of planting catchable size (12 to 15") rainbow trout and fingerling (5") brown trout in Pow Wow Pond each year. Similar sized rainbow trout will continue to be stocked into the foreseeable future, along with completion of the last year of a 3 year stocking plan for juvenile brown trout. After this, both rainbow and brown trout stocking would be evaluated to assess their contribution to the recreational fishery and usefulness in controlling goldfish.

Based on availability of those fish species considered for stocking (Appendix C) and the urgency of taking action to control undesirable fish already in Pow Wow Pond, the Proposed Action would stock adult (12 to 16") largemouth bass (*Micropterus salmoides*). Data indicates that adult sized largemouth bass can control goldfish populations (Winter 2005). Besides being a voracious predator, this species is also popular with the angling community. Bass are usually

shipped as fingerlings, however, do to considerations noted in Alternative D for the time required before measurable impacts to the goldfish population would be noticed, adult sized bass would be stocked. In a pond the size of Pow Wow, 50 adult size bass would be stocked annually for two years. It is anticipated that this size of bass would prey on the goldfish while allowing stocked rainbow and brown trout to grow and be caught by anglers. Stocking of wild fish, such as adult size largemouth bass, requires a permitting and approval process conducted by the Montana Fish, Wildlife and Parks Fish Health Committee. As such, a narrative containing a more detailed description of this wild fish transfer is located in Appendix C.

Stocking a combination of trout and bass would enhance the recreational fishery by providing a variety of fish to catch and establish measures to quickly control undesirable fish species. In order to maximize predation on undesirable fishes, fishing regulations requiring bass to be returned to the water (catch and release) would be enacted during the first two years. By doing so, this effort would create a self-sustaining bass population that could be used for transferring bass to other ponds that may be built in the future; further reducing long-term costs of maintaining Malmstrom's recreational fishery.

2.2.4 Monitoring – Both the existing pond and proposed new pond would be evaluated to assess the success of this Proposed Action on Malmstrom's recreational fishery. This would include, but not be limited to creel surveys and standard sampling of the fishery, and collection of water quality information.

2.3 ALTERNATIVES TO THE PROPOSED ACTION

Alternatives to the Proposed Action (***Alternative E***: Control undesirable fish in Pow Wow Pond through introduction of a predatory fish and build a new pond adjacent to Pow Wow Pond) include: ***Alternative A***: No action; ***Alternative B***: Drain Pow Wow Pond to eliminate undesirable fish and restock with preferred fish species; ***Alternative C***: Remove undesirable fish through use of a chemical fish toxicant; ***Alternative D***: Control undesirable fish in Pow Wow Pond through introduction of a predatory fish; and ***Alternative F***: Control undesirable fish in Pow Wow Pond through introduction of a predatory fish and build a new pond near the traffic circle in the Outfall 1 detention pond.

2.3.1 No Action Alternative

Under Alternative A, no action would be taken to increase the number of fishable acres available

to Base families, nor remove undesirable fish species. Thus, Alternative A would not improve the recreational fishery of Malmstrom AFB or eliminate illegally stocked, undesirable fish species. The goldfish population and other illegally introduced fish species will likely continue to survive and reproduce in the pond, thereby reducing the current and future quality of recreational fishing. This action does not achieve the desired result of improving opportunities for recreational fishing on Malmstrom AFB.

2.3.2 Alternatives Eliminated From Consideration

Alternative B: Drain Pow Wow Pond to eliminate undesirable fish and restock with preferred species of fish - Alternative B would drain the water out of this pond through the use of several large submersion pumps. This would take approximately 2 weeks, provided storm water run-off events do not occur during draining efforts. Water would be pumped to a location that would ensure transported fish could not populate another body of water. The pond would need to remain completely dry for approximately 2 months to ensure the complete eradication of all undesirable fish species. Besides making the pond unavailable for fishing for an extended period of time, completely draining the pond dry would negatively affect the wetland vegetation and other species (crayfish, painted turtles, frogs, and birds) dependant on the pond maintaining its current water level. Refilling the pond would depend on precipitation that occurs in the Great Falls region and could take several months to a year to restore normal depths. Additional time would then be required for the aquatic system to return to pre-drawdown conditions in order to support fish life. This alternative was dropped from further consideration because of the difficulty with keeping the pond completely dry for an extended period of time, the uncertainty of refill in a timely manner, and the potential adverse effects to the associated wildlife community.

Alternative C: Remove undesirable fish through use of a chemical fish toxicant – This alternative would use a sanctioned fish toxicant to remove undesirable fish from Pow Wow Pond. Similar to methods described in Alternative B, pumps would be used to reduce water depth in the pond to an acceptable level for the most efficient use of a fish toxicant. Chemical application would only be performed when the water level is below the outlet to ensure that treated water cannot escape from the pond. During application, public access would be closed while the chemical mixes completely in the pond and dead fish are removed. Following treatment, USAF staff would prohibit public entry for at least 24 hours after application or until it is deemed safe to reopen the area. The chemical would be administrated by individuals certified as pesticide applicators with the State of Montana. A Health and Safety Plan developed for rotenone and applied during the chemical treatment of Pow Wow Pond in 2005 is located in Appendix E. After treatment, success would be evaluated. If a complete fish kill had been

accomplished, sentinel cages occupied by small trout would be placed in the pond to monitor their survival prior to subsequent fish stocking efforts.
Two chemical fish toxicants usually considered for use in fish removal efforts are Rotenone and Antimycin. Rotenone is a restricted use pesticide approved by the EPA for fishery use (USEPA 2003). It is toxic to fish, killing them by blocking oxygen uptake at the cellular level. The EPA has determined that the use of rotenone for fish control does not present a risk of unreasonable adverse effects to humans and the environment. It is generally nontoxic to most mammals and birds at concentrations used for fish; but is however lethal to zooplankton and many aquatic invertebrates. To accomplish a complete kill, 2.5% synergized rotenone solution would be applied to the surface of a pond and dripped into any inflowing water. The present cost of rotenone is about $40 per gallon. During the treatment of Pow Wow Pond in 2005, 40 gallons of rotenone were used.

Antimycin is an antibiotic that is EPA registered for removing fish from aquatic systems. It is lethal to trout in concentrations as low as 2ug/l over a period of 24 hours, and is effective in cold waters with a neutral to acid pH. Like rotenone, it kills fish by inhibiting cellular respiration. If used, it would generally be applied in the same locations and using the same methods and controls as described above for rotenone. Antimycin is more easily neutralized than rotenone and when used in the proper concentration is less harmful than the recommended killing concentration of rotenone to aquatic life other than fish. Antimycin's toxicity is diminished by high alkalinity, high temperatures, sunlight, and the metabolic activity of cellular organisms. This alternative was removed from consideration because it failed to provide families a place to fish from while additional ponds were being constructed elsewhere and for similar concerns for the aquatic community as was stated in Alternative B. However, it would be considered for future use if the recreational fishery declines to the point where starting over is warranted.

Alternative D: Control undesirable fish in Pow Wow Pond through introduction of a predatory fish - Alternative D would introduce a predatory fish species into this pond to control undesirable fish that are present. Suitable species that meet the approval of Montana Fish, Wildlife and Parks are channel catfish (*Ictalurus punctatus*), tiger muskellunge (*Esox lucius x E. masquinongy*), and largemouth bass. Channel catfish are a slow-growing, long lived species that can tolerate turbid water and would probably do very well in the existing pond and possibly in ponds to be constructed. Channel catfish can grow to a large size and may consume the largest of the goldfish but would not completely eradicate them. While it is thought that channel catfish could become established and self-sustaining in a pond, they are not a widely popular sport fish.

Tiger muskellunge (muskies) are an artificially created hybrid species, the result of spawning northern pike (*Esox lucius*) with muskellunge (*Esox masquinongy*) in a hatchery setting. The

result is a fish that is sterile, fast growing, short-lived, and a voracious predator. Tiger muskies are produced on an as-needed basis and shipped to the requester by only a few hatcheries nationwide. Currently, tiger muskies are not available from State or Federal Fish Hatcheries. While little data exists on their growth rates or specific habitat requirements, they have been successfully used in Montana. Like channel catfish, tiger muskies would suppress the goldfish population, but may not eradicate them. Being highly voracious and able to reach large size, this fish could negatively impact the current fishery of Pow Wow Pond by preying on the stocked trout. Either of these fish species could be stocked along with a bait fish, such as blue gill (*Lepomis macrochirus*) or yellow perch (*Perca flavens*), in developing a different fish community for stocking other ponds on Malmstrom AFB that are not managed as a trout – bass fishery.

Channel catfish and tiger muskies were dropped from this consideration because they fail to achieve the desired objective – complete control of undesirable fish in the Pow Wow Pond fishery. The predacious nature of both tiger muskies and largemouth bass require that they be shipped and stocked as juveniles (~ 5 inches) from hatcheries, resulting in a 2-3 year lag time for them to reach sufficient size to begin preying on the smallest goldfish. This also means that the adult goldfish present in Pow Wow Pond would avoid being preyed upon and continue to reproduce until either of these species is large enough to have an impact. Thus measurable improvement to the recreational fishery is not anticipated for several years by stocking either of these predators. However, by stocking adult size largemouth bass, all goldfish would be preyed upon through the initial and subsequent stockings, thereby rapidly effecting positive change to the pond's fishery.

Alternative F: Control undesirable fish in Pow Wow Pond through introduction of a predatory fish and build a new pond near the traffic circle in the Outfall 1 detention pond – Besides introducing a predatory fish species into Pow Wow Pond to control undesirable fish, this alternative would also build a new pond in the northwest corner of Malmstrom AFB. The Proposed Action (Alternative E) and Alternative D already describe the justification for which species of fish is suitable for controlling undesirable fish inhabiting Pow Wow Pond.

Building a new pond near the traffic circle in the northwest corner of Malmstrom AFB would create a fishing pond within walking distance for most residents. However, building in this location would also pose a hazard to housing residents, as the pond would not be enclosed or access regularly monitored, thereby creating an attractive nuisance. The proposed area is gently sloped and a dam could be built to create an impoundment and small pond. Structures already in place within this area collect storm water runoff and could be used to fill the pond once an impoundment is created. Thus the addition of this pond could function as a water retention area

effectively reducing flow events from Malmstrom AFB that impact Whitmore Ravine.

Creating a new pond would require an extended period of time and effort to establish a functioning aquatic system prior to stocking a new fish community. Fish could be stocked in this new pond with the realization that most would not survive long and die, resulting in an unfavorable impression to its visitors. Amenities similar to those associated with Pow Wow Pond would need to be installed before families might frequent the area more often. These concerns prevent timely and measurable improvements to the recreational fishery and remove this alternative from further consideration. This alternative would offer families additional options for fishing, should expansion of recreational fishing opportunities beyond those provided in the Proposed Action be deemed necessary in the future.

3.0 AFFECTED ENVIRONMENT

The affected environment is the existing condition/baseline against which impacts caused by the Proposed Action are assessed. Potential issues and environmental concerns are identified during analysis of the affected environment. The location and extent of the affected environment depends on characteristics of the Proposed Action, the resources present, and the applicable laws and policies. The potential affected environment considered in this EA are the geology, soils, water, vegetation, fish, wildlife, and land resources in the immediate vicinity of the area selected for stocking, treatment, and/or pond construction. The following sections describe the affected environment in terms of the air, water, geology, biology, cultural, and socioeconomic resources. Existing conditions for noise, health and safety, land use, and environmental justice are also described.

3.1 AIR RESOURCES

Air resources describe existing concentrations of various pollutants on climatic and meteorological conditions that influence the quality of the air. Precipitation, wind direction and speed, and atmospheric-stability are factors that determine the extent of pollutant dispersion. Monitoring of air-borne particles may be done to document if acceptable exposure limits are exceeded. If limits are exceeded, construction will be postponed until levels can be mitigated.

3.1.1 Climatology and Meteorology

Malmstrom AFB is located in north central Montana. It is on the dry eastern side of the Rocky Mountains and has a modified semiarid continental type climate. Summertime is characterized by cool nights, moderately warm and sunny days, with very little hot, humid weather. Winters

are milder than would be expected of a continental location at this latitude because of frequent warm, down-slope winds (Chinooks) that produce temperature changes of 40° F or more in 24 hours (USAF 1998). July is generally the warmest month, with a mean high temperature of 84° F (Western Regional Climate Center [WRCC] 1999). January is usually the coldest month, with a mean low temperature of 13.7° F (WRCC 1999). The growing season averages 135 days per year (USAF 1998). Average wind velocity is 12.8 miles per hour from the southwest (WRCC 1999).

Average annual moisture is 15 inches with an average annual snowfall of 43.6 inches (WRCC 1999). Most of the precipitation during the late fall, winter, and early spring falls as snow, but Chinook winds prevent large accumulations (USAF 1998). Prevailing winds are from the southwest year-round and are generally moderate with speeds exceeding 25 mph only 2 percent of the time. Based on the average annual precipitation, the area would normally be classified as semi-arid. However, about 70 percent of the annual rainfall typically occurs during the April to September growing season, so the climate is favorable for dry land farming (USAF 1998).

3.1.2 Air Quality

Under the Clean Air Act of 1970, EPA developed primary and secondary National Ambient Air Quality Standards for each of the seven criteria pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide. These standards establish pollution levels in the United States that cannot legally be exceeded during a specified time period. Montana has adopted additional state air quality standards (the Montana Ambient Air Quality Standards). These establish statewide targets for acceptable amounts of ambient air pollutants to protect human health. According to Montana DEQ Monitoring and Data Management Bureau, the area surrounding and including Malmstrom AFB is classified as having achieved attainment for National and Montana ambient air quality standards.

3.2 WATER RESOURCES

Malmstrom AFB lies on a plateau roughly 10 square miles in extent, with drainage northward toward the Missouri River (USAF, 2009). Water resources consist of groundwater and surface water. Drainage features in the area are primarily ephemeral streams and coulees. Potable groundwater is present at depths greater than 100 feet. All water used at Malmstrom AFB is supplied by the City of Great Falls and is treated surface water from the Missouri River.

3.2.1 Groundwater

Groundwater resources in the region include both deep (below 100 feet) and shallower aquifers of unconsolidated alluvium and bench deposits (at depths of 20 to 40 feet); each of variable quality. The major aquifers under Malmstrom AFB include alluvial deposits, glacial deposits, the Kootenai Formation, and the Madison-Swift Aquifer (USAF 1998). While confined aquifers in the area tend to flow northward; shallow, unconfined aquifers typically follow topographic gradients. The depth to a major aquifer at Malmstrom AFB varies and is estimated at 100-200 feet below ground surface (USAF 1998). The Madison-Swift aquifer has the greatest potential for future development and feeds Giant Springs, one of the largest springs in the world, which is located about 2 miles northwest of Malmstrom AFB. Due to the ample surface water supply and the depth of most of the aquifers, groundwater resources have not been developed on the Base (USAF 1998).

Shallow groundwater (less than 25 feet below ground surface) has been encountered in some locations on Malmstrom AFB (USAF 1998). Due to a limited supply of water and discontinuous nature of this shallow aquifer, it is unlikely to be used as a water source in the future.

3.2.2 Surface Water

The Missouri River is located 0.9 miles north of the Base and serves as the principal source of potable water for Malmstrom AFB and the City of Great Falls (USAF 2008). The USFWS classified the Missouri River as a Wild and Scenic River from the confluence with the Teton River, which is 50 miles northeast of Malmstrom AFB, to the confluence of the Musselshell River, 150 miles further downstream and east of Malmstrom AFB (USAF 1998).

No perennial streams are present on Malmstrom AFB (USAF 1998). Natural drainage features consist primarily of ephemeral streams and coulees (trench-like ravines). Figure 3 shows the Surface Water Drainage Patterns. Surface water is limited to runoff from groundwater uses, storm water, and facility operation collection systems. Three man-made impoundments exist on Malmstrom AFB to collect storm water runoff: Pow Wow Pond and two smaller ponds near the Central Heat Plant. Nine primary surface water drainage basins have been identified on Malmstrom, and consist of a system of swales, open trenches, and some covered pipes (USAF 2008. The Proposed Action would take place in drainage area 6, while Alternative F would occur in drainage area 1.

3.3 GEOLOGICAL RESOURCES

Geological resources include geology, seismicity, and soils within Malmstrom AFB boundaries.

3.3.1 Geology

Malmstrom AFB is located on the Sweetgrass Arch, a bedrock structural feature extending northwest between the Little Belt Mountains, 24 miles to the south and into Alberta, Canada. Stratigraphic units important to the framework of the region surrounding Malmstrom AFB range in age from the Madison Limestone formation of the Mississippian era (360 million years) to the Eolian Sand of the Holocene (10,000 years) (USAF 1998). These units include sedimentary bedrock formations, unconsolidated glacial deposits, and windblown deposits. Figures 4 and 5 illustrate the geology of Malmstrom AFB. There are no known geologic hazards in this area.

3.3.2 Soils

The area is located on the glaciated plains of Montana. Soils overlie glacial till with a montmorillonitic shale substrate (Montana Agricultural Experiment Station 1982). The predominant soil series is Lawther silty clay soils (USAF 1998). Soil water capacity is high and the soils tend to be fine-grained. Area soils have a high shrink-swell capacity and are rated as poor for construction purposes. The susceptibility of the soil to wind and water erosion is moderate (USAF 1998).

3.4 BIOLOGICAL RESOURCES

3.4.1 Vegetation, Wetlands, and Floodplains

Malmstrom AFB is located on flat to gently rolling terrain that is dominated with short grassland vegetation. Most indigenous vegetation within Malmstrom AFB boundaries has been removed; initially by farming and most recently by building and road construction. No threatened or endangered plant species have been identified on the Base (Montana Natural Heritage Program 2009 and USFWS website: www.ecos.fws.gov/endangered/wildlife.html). Malmstrom AFB lies on a high plateau south of the Missouri River, approximately 100 feet above the 100-year floodplain of the river (USAF 1998). Roughly 36 acres of wet areas and moist seeps have been identified on Malmstrom AFB, ranging from standing water (Pow Wow Pond) to intermittent streambeds that flow only after heavy downpour events (USAF 2008). In most cases, these were man-made wet areas associated with storm water retention areas.

Vegetation in the immediate area of both sites considered for pond construction consists of

upland grasses (crested wheatgrass, smooth brome, Kentucky bluegrass) and are maintained through mowing during the summer months (Hydrometrics, Inc. 2003). Stands of wetland grasses (Nebraska sedge, Baltic rush, hardstem bulrush), forbs (cattail), and willow (sandbar willow and geyser willow) are found along the shoreline of Pow Wow Pond. The adjacent pond shoreline is predominately wetland vegetation with dispersed sections of upland grasses or bare eroding soil. Willows occur along the east and west ends of the pond. Upland grasses compose the primary cover above the pond and adjacent open areas.

3.4.2 Fish and Wildlife

Several surveys of fish and wildlife species have been completed on Malmstrom AFB over the years (USFWS 2002). Historically, wildlife found in the area included bison (*Bison bison*), elk (*Cervus elaphus*), pronghorn (*Antilocapra americana*), mule deer (*Odocoilieus hemionus*), white-tailed deer (*Odocoilieus virginianus*), black bear (*Ursus americanus*) and many small mammals. Currently however, with the development and related fragmentation of habitats, wildlife species commonly found include white-tailed jackrabbit (*Lepus townsendi*), cottontail rabbit (*Sylvilagus nuttali*), badger (*Taxidea taxus*), striped skunk (*Mustels mephitis*), Richardson's ground squirrel (*Spermophilus richardsonii*), red fox (*Vulpes vulpes*), shrews (*Sorex araneus*), voles (*Microtis pennsylanicus*), and mice (*Peromyscus maniculatus*). There appears to be transient use of the area by coyotes (*Canis latrans*).

Seventeen (17) bird species were identified on the Base including long-billed curlew (*Numenius americanus*), California gull (*Larus californicus*), common snipe (*Capella gallinago*), cliff swallows (*Petrochelidon pyrrhonota*), brown-headed blackbirds (*Molothrus ater*) and great blue heron (*Ardea herodias*). Horned larks (*Eremophila alpestris*), grasshopper sparrows *Ammodramus savannarum*), and western meadow larks (*Sturnella neglecta*) were found to be common as well.

During the same surveys in 2001, a prairie rattlesnake (*Crotalus viridis viridis*), plains garter snake (*Thamnophis radix*), and leopard frog (*Rana pipiens*) were recorded. Six western painted turtles (*Chrysemys picta*) and one northern leopard frog (*Rana pipiens*) were also observed in Pow Wow Park Pond. Additional observations of aquatic life in Pow Wow Park Pond included rainbow trout (*Oncorhynchus mykiss*), white suckers (*Catostomus commersoni*), crayfish (Orconectes virelis), fathead minnows (*Pimephales promelas*), and goldfish (*Carassius auratus*) USFWS 2002).

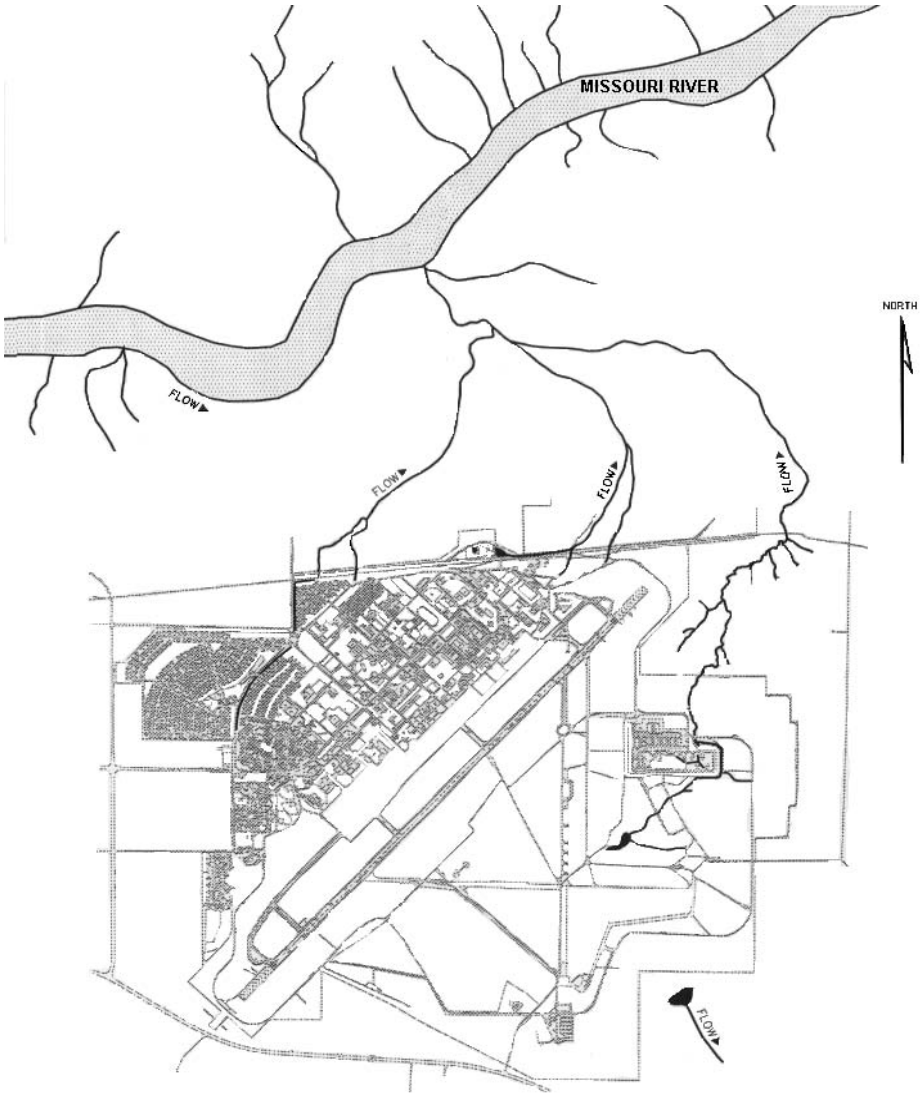


Figure 3. Surface Water Drainage Patterns - Malmstrom Air Force Base, Source: USAF 1998, Tetra-Tech EM Inc. 2000.

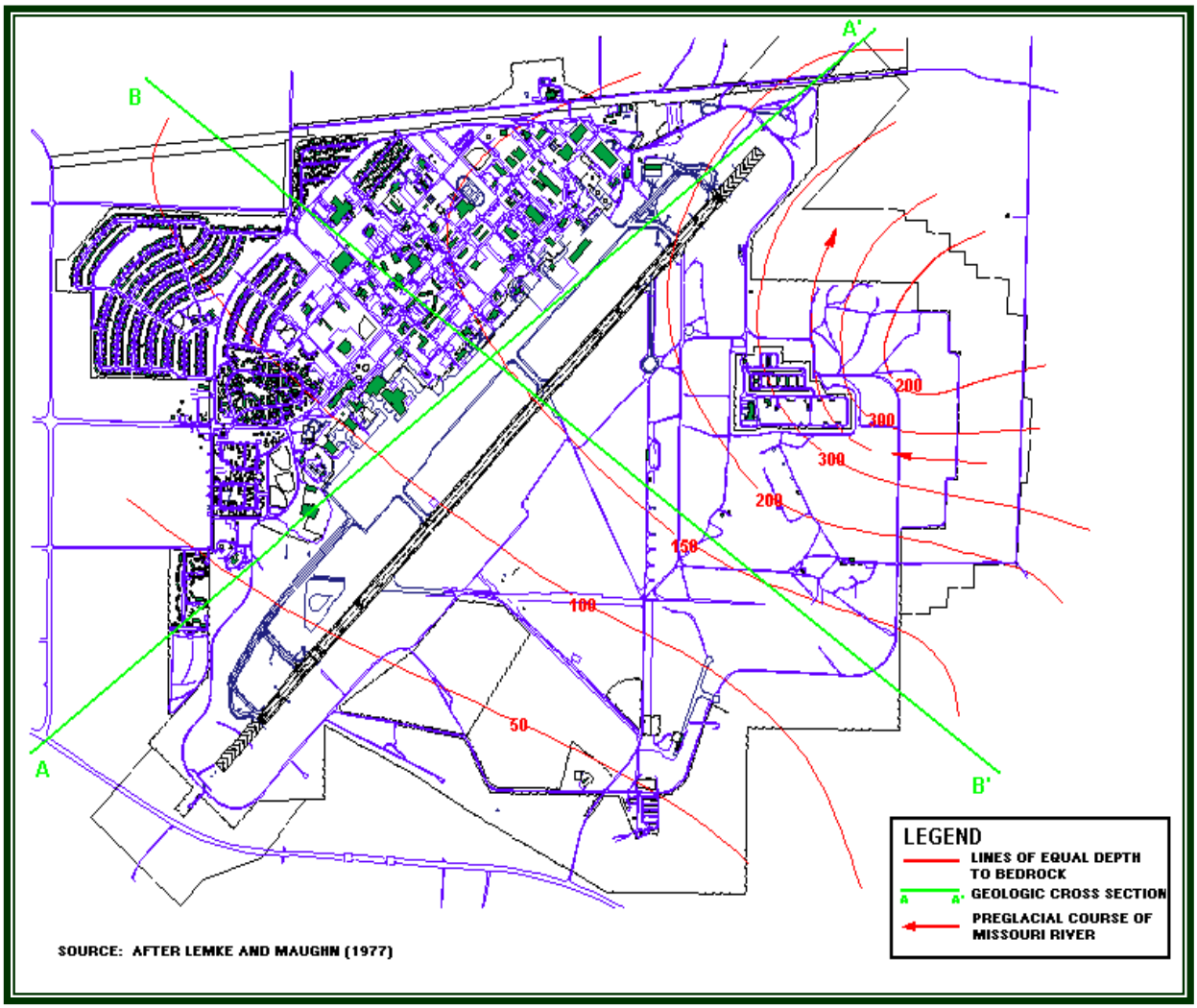


Figure 4. Depth to Bedrock - Malmstrom Air Force Base, Source: USAF 1998, Tetra-Tech EM Inc. 2000.

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No federally listed endangered, threatened, proposed/candidate species, sensitive species, Montana State listed species of concern, or identified critical habitat for such species are known to occur on Malmstrom AFB (Montana Natural Heritage Program 2009 and USFWS website). While previously listed, the bald eagle (*Haliaeetus leucocephalus)* was removed from the Endangered Species list on June 28, 2007 however; it remains on Montana's Species of Concern list. Thus, while this bird likely occurs along the Missouri River, it has not been reported in the vicinity of Malmstrom AFB (Hart Crowser 2004, Montana Natural Heritage Program 2009). Additionally, no federally listed threatened or endangered plant species (Appendix B) have been identified on Malmstrom AFB during the various FWCO conducted wildlife surveys. A complete list of threatened and endangered species found in Montana is located in Appendix B.

One state-recognized species (the upland sandpiper) may migrate through the area but has not been document as a resident. Although threatened or endangered wildlife species do not currently impose a constraint to development on Malmstrom AFB (USAF 1998) and no specific protective measures are required, consideration should be given to avoid destroying habitat these species prefer.

3.5 CULTURAL RESOURCES

Cultural resources consist of paleontological and archeological (both prehistorical and historical) finds. While significant paleontological resources occur in Montana, the area around Malmstrom AFB is underlain by 30 to 100 feet of glacial sediments. Such areas do not tend to produce paleontological finds and none have been located within the boundaries of Malmstrom AFB (USAF 1998). Upland areas like those on which Malmstrom AFB is located, have a lower potential for cultural and historic sites than areas located within a floodplain.

The USAF has developed an Integrated Cultural Resources Management Plan (ICRMP) to provide a means for managing historic and cultural resources on the Base and missile deployment areas (USAF Draft 2009). This document identifies preservation strategies for specific archeological and historical properties including a railroad and buildings greater than 50 years old. These properties are not present in the vicinity of either site considered for constructing a new pond.

In addition to the ICRMP, two archeological and historical resources surveys have been conducted on Malmstrom AFB proper. A Cold War Resources Survey of Malmstrom AFB was completed in 1998 (USAF 1998) and in 1994, an Archaeological Survey report found one prehistoric site: a small lithic scatter that is not located on either the Proposed Action or Alternative F. A segment of the Chicago, Milwaukee, St. Paul, and Pacific Railroad (now

Burlington Northern and Santa Fe Railway) is located along the northern perimeter of the installation (USAF Draft 2009). Potential buildings and facilities eligible for inclusion to the NRHP were identified in the Cold War Survey completed in 1998 and are shown in Figure 5.

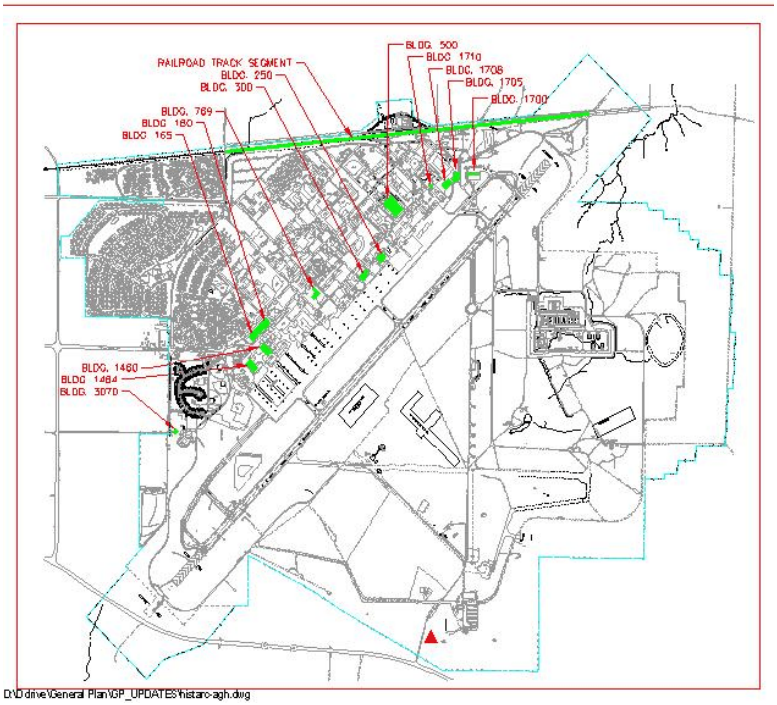

Figure 5. Location of Cultural resources - Malmstrom AFB, Source: USAF 1995.

3.6 NOISE

The Air Force defines noise as any unwanted sound that interferes with normal activities or in some way reduces the quality of the environment. In general, noise levels around Air Force installations result primarily from aircraft operations, vehicle traffic in the vicinity, or other background noise sources (USAF 1998).

Sensitive receptors are populations that are more susceptible to the effects of noise than is the general population. Potential sensitive receptors normally include hospitals, churches, and both residential and wildlife areas. The nearest residence is within the study area of the affected environment.

Scientific studies and social surveys conducted to appraise community reaction to all types of environmental noise have found the day-night average sound level (Ldn) descriptor to be the best measure of annoyance. The Ldn describes the 24-hour or daily noise environment. To compute an Ldn, single noise events are measured using an A-weighted scale corrected for the number of events and the time of day. A 10-decibel penalty is added for noise that occurs between 10 p.m. and 7 a.m. because nighttime noise is considered more annoying than noise occurring during daytime. The Ldn descriptor is accepted by federal agencies, including the U.S. Army, as a standard for estimating noise impact and establishing guidelines for comparable land uses (U.S. Army Corps of Engineers 1998).

3.7 HEALTH AND SAFETY

This section describes programs and activities currently in place at Malmstrom AFB and the proposed project sites that address public and worker health and safety. It includes a description of general public health and safety responsibilities, solid and hazardous waste management, sewage and storm water management, environmental remediation activities, pesticide application, and harmful substances in the project area.

3.7.1 Public Health Management

Public health and safety at Malmstrom AFB is protected by the USAF and agencies of the City of Great Falls, Cascade County, the State of Montana, and the federal government. Malmstrom AFB provides its own police protection and emergency response, while ambulance service is provided by off Base contractors. The 341st Medical Group is responsible for monitoring public health and safety issues such as drinking water quality and disease control. The Montana DEQ regulates waste management, toxic substance reporting, and investigation and cleanup of

contaminated sites. The 341 CES/CEAN provides regulatory guidance to Malmstrom AFB personnel regarding safe use, storage, and disposal of hazardous and toxic substances and has a pollution prevention program that includes minimization of hazardous wastes and recycling.

The EPA regulates the use and application of pesticides including rotenone. Rotenone is designated as a category 1 pesticide due to its extreme toxicity for acute (short term) periods. It is only to be administered by applicators with a federal or state certification and is labeled as "restricted use pesticide" due to its aquatic toxicity and potential adverse inhalation effects on humans. The EPA has determined the use of rotenone for fish control does not present a risk of unreasonable adverse effects to humans and the environment.

3.7.2 Solid and Hazardous Waste Management

Solid and hazardous waste programs provide for the collection, handling, and disposal of waste materials, response operations to spills of hazardous materials or waste, and management of the Installation Restoration Program (IRP). In Montana, hazardous and solid waste issues are regulated by the Montana DEQ.

At Malmstrom AFB, the solid and hazardous waste programs are managed by the Environmental Management Flight (341 CES/CEAN). The responsibility to develop a Spill Prevention and Response Plan and provide procedures for spill reporting, containment, cleanup, and disposal resides with Natural Resources Management Section. The Fire Department requests support, as needed, from local volunteer departments in the event of a spill (USAF 1998).

Hazardous wastes are recorded and processed through the Natural Resources Management Section and Defense Reutilization and Marketing Office (DRMO) (USAF 1998). Solid waste collection and disposal services are provided to Malmstrom AFB by civilian contractors with material taken to a private landfill. Malmstrom AFB generates about 4,500 tons of solid waste per year.

3.7.3 Storm Water Management

Storm water is considered a wastewater discharge by the Clean Water Act. Storm water is discharged from Malmstrom AFB in accordance with a Montana Pollution Discharge Elimination System (MPDES) general permit for storm water discharges associated with small municipal separate storm sewer system (MS4), and MPDES general permit for storm water discharges associated with construction activities.

3.7.4 Environmental Remediation Activities

The USAF is undergoing cleanup of contaminated sites created by past activities under the Installation Restoration Program (IRP) and the Compliance Restoration Program (CRP). There are 5 IRP sites and 7 CRP sites on Malmstrom AFB currently being investigated or undergoing cleanup activities (USAF 2011). None of the active IRP/CRP sites are in the immediate vicinity of the Proposed Action. One of the closed (inactive) IRP sites is adjacent to the Northeast side of Pow Wow Pond (SS-17 - Drum Disposal Site South of WSA). This site (SS-17) was investigated and determined to have no significant contamination.

3.7.5 Pesticides

Past spraying of herbicides has occurred throughout Malmstrom AFB and possibly at sites of the Proposed Action. Because herbicides used for base-wide spraying were biodegradable and would have dissipated from the soil in less than a year, any herbicides applied in the past would likely not be present at this time (USAF 1999).

3.8 SOCIO-ECONOMICS

According to the U.S. Bureau of the Census, the population of the area including Malmstrom AFB and surrounding greater Great Falls-Cascade County as of 2000 is 80,357 with the majority of the population, 56,690 people, living in Great Falls; median household income is $32,971; and 13.5 percent of the population is at or below the poverty level. The civilian labor force totals roughly 40,000. Of the adult population over 25 years of age, 75 percent have high school or higher education (City of Great Falls Chamber of Commerce 1999). The unemployment rate in the area was 4.9 percent as of 1994 (USAF 1998).

Malmstrom AFB plays a significant role in the regional economy, employing approximately 4,150 military and civilian employees, directly accounting for more than 13 percent of employment in the area. Malmstrom AFB also contributes approximately $228 million annually to the area's economy through its payroll and direct spending in the area (USAF 1998). Other major employers include the Great Falls School District, Benefis Health Care, Cascade County, and Sletten Construction. Retail sales also employ a significant portion of the local work force (City of Great Falls 1999). Higher education facilities include Montana State University-Northern, the University of Great Falls, and Montana State University College of Technology.

3.9 LAND USE

This section provides a general description of Malmstrom AFB including historical and present mission. Land uses on Malmstrom AFB include Airfield, Aircraft Operations and Management, Industrial, Administrative, Medical, Personnel Housing, Community Commercial, Community Service, and Outdoor Recreation (Hydrometrics 2003). Land use in the vicinity of the Base is predominantly rural-agricultural.

3.9.1 History of Malmstrom AFB

Construction for an Army Air Corps base east of Great Falls began in 1942. Known as Great Falls Army Air Base, its function was to establish an air route between Great Falls and Fairbanks, Alaska, as part of the Lend-Lease program during World War II. Commonly called the East Base, it also served as a training center for B-17 bombers. After World War II, the Military Air Transport Service used this facility as a training center for C-54 transport crews. In 1955, it was renamed Malmstrom Air Force Base and the 4061st Air Refueling Wing (ARW) arrived in 1957. The 4061st ARW was deactivated in 1961 with the arrival of the 341st Strategic Missile Wing (SMW). Malmstrom AFB was re-designated as the 341st Missile Wing in September 1991. The 341st Missile Wing resumed the host unit status in July 1994, and is currently responsible for maintaining Minutemen III intercontinental ballistic missiles and operation/management of Malmstrom AFB. In 1997, the 819th RED HORSE squadron was installed at Malmstrom AFB.

3.9.2 Current Mission of Malmstrom AFB

Malmstrom AFB is home to the 341st Missile Wing, which operates and maintains 150 land-based Minutemen III Intercontinental Ballistic Missiles in north-central Montana. Associate units based and supported by Malmstrom AFB include the Air Force Office of Special Investigations; 819th RED HORSE Squadron; USAF Judiciary Area Defense Council; and Defense Reutilization and Marketing Office-Great Falls (USAF 1998).

3.10 Environmental Justice

A National Environmental Policy Act (NEPA) evaluation of a Proposed Action must include an assessment of effects on minority and low-income populations, and an alternative location or action must be considered if the Proposed Action discriminated against a minority or low-income population. Based on the 2000 Census (U.S. Bureau of Census 2000), about 13.5 percent (10,848 people) of Cascade County's population is below the poverty level, which is just below the state wide level of 14.1 percent.

4.0 ENVIRONMENTAL CONSEQUENCES

The purpose of this EA is to identify the potential for significant impacts to the biophysical and human environment of a federal action. To identify the possible environmental effects, a screening level analysis was conducted. Screening consisted of identifying main elements of the Proposed Action and determining potential environmental disturbances caused by each element.

A matrix was used as a screening tool in identifying how the Proposed Action may affect the various environmental parameters. Table 1 presents the extent of impacts from the Proposed Action and No Action Alternatives relative to each resource area of concern. The purpose of the matrix is to narrow the scope of potential environmental impacts associated with the overall program and focus on those consequences of concern. The matrix identifies only the potential for impacts and establishes those disturbances that may intensify, dependent upon the existing environment.

Table 1
Identification of Potential Impacts

Disturbance	Proposed Action	No Action
Air	minor impact	no impact
Water	minor impact	no impact
Geological	minor impact	no impact
Biological	beneficial impact	no impact
Cultural	no impact	no impact
Noise	minimal impact	no impact
Health & Safety	minor impact	no impact
Socioeconomic	no impact	no impact
Land Use	beneficial impact	no impact
Env. Justice	no impact	no impact

There were five criteria used in the matrix to identify the potential for impact. The criteria are defined as follows:

- Beneficial Impact: The element is expected to improve or lessen the undesirable effect of the disturbance.

- No Impact: The element is not expected to cause a disturbance or the element is not applicable.

- Minimal Impact: The element is not expected to create a measurable impact, or the impacts are too small to cause any change in the environment.

- Minor Impact: The element is expected to cause a measurable disturbance but is within the capacity of the impacted system to absorb the change, or the impacts can be compensated for with little effort and resources so the impact is not substantial.

- Significant Impact: The element is expected to cause disturbance at a level likely to be significant in the NEPA sense. This matrix intersection would require additional analysis and preparation of an Environmental Impact Statement (EIS).

The primary impacts of the Proposed Action arise from building a new pond. Potential impacts are measured against current baseline conditions.

4.1 AIR RESOURCES

The significance of impacts to air quality is based on federal, state, and local pollution regulations or standards. A significant impact would be a violation of air quality standards, exceedance of a nonattainment criterion, or exposure of sensitive receptors to increase pollutant concentrations. A beneficial impact to air quality would be a reduction in baseline emissions.

4.1.1 Potential Impacts from the Proposed Action

There is potential for minor impacts to the air quality during the construction phase of building the pond impoundment due to soil and dust particles being released in conjunction with transporting and dumping fill material. These impacts are expected to be short term in nature. Because of the temporary nature of constructing a new pond, any potential air quality impacts would be short-term and limited to a localized area around the new pond site. No long term impacts to the air quality are anticipated. Thus, overall impacts to air resources from the Proposed Action would be insignificant.

4.1.2 Potential Impacts from the No Action Alternative

No impacts to air quality would result from the No Action Alternative.

4.1.3 Unavoidable and Cumulative Impacts

Under both the Proposed Action and No Action Alternatives, no cumulative impacts to air quality would be expected. Regarding the projects contribution to greenhouse gases; currently there are no standards to determine the significance of the cumulative impacts from these

emissions. In the absence of any standards to the contrary, the amount of emissions associated with this project would not have a significant [cumulative] impact on stratospheric ozone depletion or on global warming.

4.1.4 Potential Impacts from Alternative F

There is potential for minor impacts to the air quality under Alternative F during the construction phase of building the pond impoundment due to soil and dust particles being released in conjunction with transporting and dumping fill material. While the impact would be short-term, it would have a noticeable effect on residents since the construction location is near a housing area. However, no long term impacts to the air quality are anticipated. Thus, overall impacts to air resources from this Alternative would be insignificant.

4.2 WATER RESOURCES

Water resources are surface and subsurface resources that are finite but renewable. Water may be affected by physical disturbances and material releases into surface and groundwater. An impact to water resources at Malmstrom AFB would be considered significant if an aquifer, groundwater well, or surface water body is degraded resulting in a measurable change in a user's water supply. Another significant impact would be affecting the quality of surface water or groundwater so that it exceeds federal or state water quality criteria or maximum contaminant levels (MCLs). An impact would be insignificant if the change in the water quality did not exceed an MCL or the change in water quantity attributable to the Proposed Action was un-measurable. Increased recharge or improved water quality are examples of beneficial impacts.

4.2.1 Potential Impacts from the Proposed Action

Groundwater - The Proposed Action is not anticipated to effect groundwater sources. Soil excavation is anticipated to be minimal in the area of the new pond during building of an impoundment. This area is well below that of Pow Wow Pond and the height of the impoundment would allow creating a deep enough pond to sustain a fish community and its corresponding aquatic system without significantly altering the landscape. Possible benefits include increased ground water recharge due to new reservoir.

Surface Water - Surface water in the area would experience short term impacts during construction of a new pond. Under the Proposed Action, storm water generated from runoff events first flow into Pow Wow Pond with the purpose of maintaining its water depth. Excess water would flow through an outlet near the pond's dam and drain via a series of existing ditches to lower elevations. This pre-existing ditch network would first be use to convey water away

from the area where the impoundment would be built and then rerouted back to allow water from Pow Wow Pond to fill the new pond.

4.2.2 Potential Impacts from the No Action Alternative

Groundwater - The No Action Alternative would have no impact on groundwater quality.
Surface Water - The No Action Alternative would not alter current surface water resources or drainage patterns. No measurable impacts to surface water resources would be expected.

4.2.3 Unavoidable and Cumulative Impacts

No significant cumulative impacts to water resources are expected from either the Proposed Action or No Action Alternative. The construction of a new pond won't result in the discharge or placement of dredged or fill material into waters of the US, including jurisdictional wetlands. It has also been determined that potential locations proposed for future ponds won't affect the natural existing shape and form of any stream or its banks.

4.2.4 Potential Impacts from Alternative F

Since soil excavation is anticipated to be minimal in the area of the new pond during building of the impoundment, impacts to groundwater resources is not anticipated. Minor impacts to surface waters are expected from constructing a new pond in this area. However, these impacts would be beneficial in the long-term by retaining storm-water runoff and effectively reducing flow events from Malmstrom AFB that impact Whitmore Ravine.

4.3 GEOLOGICAL RESOURCES

Impacts to surface resources would result primarily from direct disturbances associated with building an impoundment and later from human use of an area through vegetation wear resulting in increased erosion from wind and water.

4.3.1 Potential Impacts from Proposed Action

Geology -The proposed site has no unique geological features. With the lack of unique topographic features on Malmstrom AFB and the absence of active seismic faults in the vicinity, the potential for impacts is insignificant. Due to the depth at which bedrock is encountered, and the nature of the proposed activity, it (bedrock) would not be affected by the Proposed Action.

Soils – The Proposed Action is within an area of glacial deposits that frequently yield montmorillinitic, moisture sensitive soils. Such soils are expansive and cause foundation related problems. Terrain in the area below Pow Wow Pond is wet, thus care should be taken in selecting proper building material and impoundment design to reduce concern over failure of the impoundment. Soils in this area are fine silty clays that are subject to wind and water erosion and could affect the pond's aquatic system.

Erosion and sediment control measures should be provided in accordance with Federal, State, and local laws and regulations. Areas of bare soil during construction should be kept to a minimum, with temporary and permanent control structures installed under best management practices (BMPs). BMPs may include, but not be limited to, vegetation cover, bank and slope stabilization, silt fences, sediment traps, inlet and outlet protection, and diversion channels. Any temporary measures should be removed after an area has stabilized. Thus, there are no anticipated impacts on soils from the Proposed Action.

4.3.2 Potential Impacts from the No Action Alternative

Geology - No impacts to geology would occur from the No Action Alternative.

Soils - No impacts to soils would occur from the No Action Alternative.

4.3.3 Unavoidable and Cumulative Impacts

Permanent changes to soil structure and stability can occur by disrupting and reworking certain soil types. Because of the limited impacts of the Proposed Action, no significant cumulative impacts with ongoing activities or other proposed activities are anticipated.

4.3.4 Potential Impacts from Alternative F

Impacts that were described for the Proposed Action would also occur to surface resources from constructing a pond in this area. BMPs would be necessary to control or minimize ground disturbances to the soils and vegetation resulting from shaping the pond and surrounding area. During pond construction, the child's play area located nearby may have to be removed or be closed off for use by residents until its determined safe to be used again.

4.4 BIOLOGICAL RESOURCES

Impacts to biological resources could include physical disruption or chemical or biological release to the soil, geology, biologic feature, habitat, or ecosystem. Impacts could be direct

impacts such as the killing of individuals of a species, destruction or degradation of habitat, or disturbance from human activities which prevents animals from utilizing their habitat; or indirect effects such as those that may results in increased human use of an area causing habitat degradation or eliminating/reducing use of that habitat by wildlife species.

4.4.1 Potential Impacts from the Proposed Action

Direct disturbances would include minor, short-term impacts to biological resources during pond construction and include possible displacement of wildlife, trampling of vegetation, and noise and dust generation. Direct impacts of the Proposed Action would include trampling or removal of vegetation and possible introduction or spread of weeds during the construction phase. Thus, there should be minimal risk to any animal or bird inhabiting the Proposed Action area.

Direct impacts to the current recreational fishery would include adding another sport fish, reducing or eliminating goldfish presence, and improving the pond's water quality. Stocking largemouth bass into Pow Wow Pond would not only increase the desire of families to continue fishing this pond, but bass would prey on goldfish that are present as well. By reducing or eliminating goldfish in this pond, the quality of the remaining fish community (bass, rainbow and brown trout) would improve through a reduction in the number of fish in the pond. The pond's aquatic system would also improve, since goldfish feeding behavior has been attributed to the poor water quality observed during the past three years. Thus, in the long-term the Proposed Action would have a beneficial effect on the biological integrity of Pow Wow Pond. Increased aquatic habitat associated with construction of a new pond would provide additional benefits for both terrestrial and aquatic wildlife.

4.4.2 Potential Impacts from the No Action Alternative

No positive impacts to biological resources would occur from the No Action Alternative. However, undesirable fish present in Pow Wow Pond would not be removed, poor water quality issues would not be addressed, and the recreational value of the current fishery would be prevented from reaching its full potential.

4.4.3 Unavoidable and Cumulative Impacts

No significant impact to the surrounding habitat or biological resources is expected from implementation of the Proposed Action or Alternatives even when considered with other activities scheduled for Malmstrom AFB.

4.4.4 Potential Impacts from Alternative F

Direct disturbances from this Alternative would include minor, short-term impacts to biological resources during pond construction and include possible displacement of wildlife through trampling of vegetation and noise and dust generation. Direct impacts would also include removal of vegetation and possible introduction or spread of weeds during the construction phase. Indirect effects may results in increased human use of an area causing habitat degradation or eliminating/reducing use of that habitat by wildlife species. However, vegetation in this area is cropped short by mowing and families already frequent the small child's play area. Thus, there should be minimal risk to any animal or bird inhabiting the location described under Alternative F.

4.5 CULTURAL RESOURCES

Significant impacts to cultural resources would include the destruction of historic or archaeological resources or modifications to these resources destroying their integrity. Beneficial impacts are those that would enhance a resource's integrity.

4.5.1 Potential Impacts from the Proposed Action

No cultural resources have been identified within the confines of either proposed site for a new pond. No historic or prehistoric sites are found near Pow Wow Pond. Thus, no significant impacts on cultural resources would result from the Proposed Action.

4.5.2 Potential Impacts from the No Action Alternative

No significant impacts to cultural resources are anticipated from the No Action Alternative.

4.5.3 Unavoidable and Cumulative Impacts

Minor ground or soil disturbance is anticipated during implementation of the Proposed Action. If any cultural resources are discovered during any phase of the Proposed Action, all procedures required by the Montana State Historic Preservation Office and the Integrated Cultural Resource Management Plan would be followed. No archeological or historical resources have been identified in or near the location selected for a new pond. Therefore, no unavoidable or cumulative impacts are anticipated from either the Proposed Action or No Action Alternative.

4.5.4 Potential Impacts from Alternative F

Similar to the Proposed Action, no cultural resources have been identified within the confines of this location for a new pond. No historic or prehistoric sites are found nearby, thus, no significant impacts on cultural resources would result from Alternative F.

4.6 NOISE RESOURCES

This section evaluates the relative significance of the potential change in the noise environment that would result from the Proposed Action. The location proposed for a new pond is located in a remote area of Malmstrom AFB and is not in the vicinity of any buildings or areas where noise may cause a disturbance.

4.6.1 Potential Impacts from Proposed Action

Any noise generated during the Proposed Action would be the result of vehicles and personnel in the area during construction of the impoundment, installing erosion and sediment containment structures, and replanting of vegetation in and around a newly created pond. Any noise that does occur during construction would be minor and temporary in nature so that no significant impacts should result.

4.6.2 Potential Impacts from the No Action Alternative

No significant impacts in terms of noise are anticipated from the No Action Alternative.

4.6.3 Unavoidable and Cumulative Impacts

Noise from actual implementation of the Proposed Action (constructing a new pond) would have no significant impact. No other ongoing activities would create a significant cumulative impact when considered together with the Proposed Action or No Action Alternative.

4.6.4 Potential Impacts from Alternative F

Noise generated would be the result of vehicles and personnel in the area during construction of the impoundment, installing erosion and sediment containment structures, and replanting of vegetation in and around a newly created pond. Any noise that does occur during construction would be minor and temporary in nature so that no significant impacts should result. However, since the site is within a housing area, noise generated from the construction activity would be noticeable by families living close by. Adding recreational activities to this area would also increase the level of noise above that typically occurring from families using the small children's play area already in place.

4.7 HEALTH AND SAFETY

This section evaluates the relative significance of potential changes affecting health, safety, and waste generated from the Proposed Action. An impact is defined as a physical or material disruption to workers or the public; exposure to chemical, physical, or biological adversities; or generation or discharge of solid/hazardous waste that must be managed.

4.7.1 Potential Impacts from Proposed Action

The potential impact of the Proposed Action is to construct a new pond on Malmstrom AFB. Risks to human health and safety are from operating heavy equipment during building of an

impoundment and to residents, especially unsupervised children. During transportation of the fill material and construction, all recommended safety standards would be followed and safety equipment would be utilized to minimize potentials hazards to humans and the environment. In addition, during pond construction, the area would be closed off to public access until construction is complete and bare soils are allowed to re-vegetate. Waste would be managed in accordance with Montana solid and hazardous waste management requirements and the Clean Water Act. All waste generated from the Proposed Action, would be disposed of in a sanitary and safe manner. Surface water would be managed in accordance with the Montana DEQ storm water program.

In view of the precautions and procedures outlined above, impacts of the Proposed Action would be minor in nature and result in no significant impact to health or safety.

4.7.2 Potential Impacts from the No Action Alternative

The No Action Alternative would not result in any change in the project area, and therefore, would not impact health and safety.

4.7.3 Unavoidable and Cumulative Impacts

Unavoidable impacts inherent with the Proposed Action include safety hazards associated with the use of heavy equipment. There would be some unavoidable waste generation from the Proposed Action in the form of construction debris and possibly excavated soil; however, the precautions and procedures outlined above are designed to minimize the potential for any adverse impacts. Thus, there would be no significant cumulative impacts to human health, safety, or waste management programs at Malmstrom AFB.

4.7.4 Potential Impacts from Alternative F

Similar impacts to those mentioned for the Proposed Action would also occur in the area under Alternative F during pond construction. In addition, during construction and beyond, the area may require additional safety measures since the location is within a housing area. These may include taller and tighter woven fence material to prevent children and pets from entering the area, frequent water spraying to control airborne dust, and on-site safety personnel monitoring pedestrian traffic through the work zone.

4.8 SOCIOECONOMIC IMPACTS

Socioeconomic impacts include a social or economic disruption effecting the employment, population, economy, public services, and housing demand in an area. Examples would be the addition or loss of jobs, additional personnel to the work force or increases or decreases in the cash flow to the local economy. The significance of an adverse impact would be measured against annual changes in socioeconomic characteristics.

4.8.1 Potential Impacts from the Proposed Action

Since the Proposed Action lies entirely within Malmstrom AFB and is located away from residential areas, this action would not have significant socioeconomic impacts. Additional revenues may be injected into the local economy by hiring nearby companies to design and construct the new pond.

4.8.2 Potential Impacts from the No Action Alternative

The No Action Alternative would result in no change to the existing situation, may not increase fishing use at the pond, or add to the local economy and would have no impact on socio-economics in the area.

4.8.3 Unavoidable and Cumulative Impacts

Based on evaluation of both the Proposed Action and No Action Alternative, there would be no significant impacts to the socioeconomic environment from either Alternative.

4.8.4 Potential Impacts from Alternative F

Since the site for Alternative F lies entirely within Malmstrom AFB this action would not have significant socioeconomic impacts. Additional revenues may be injected into the local economy by hiring nearby companies to design and construct the new pond. While the location is with a housing area, the specific site for pond construction is not contained in a plan calling for housing to be built on this land.

4.9 LAND USE IMPACTS

Impacts on Land Use could be changes in the amount or type of use in an area, or use of the land that was contrary to the mission of Malmstrom AFB.

4.9.1 Potential Impacts from the Proposed Action

The Proposed Action would change land use in the area of pond construction. Construction of a new pond would result in additional recreational use in this area and permit human presence closer to a sensitive storage facility. Additional security measures may be needed in order to permit this use beyond the existing area of Pow Wow Park.

4.9.2 Potential Impacts from the No Action Alternative

The No Action Alternative would have no impact on land use in the area.

4.9.3 Unavoidable and Cumulative Impacts

Under both the Proposed Action and No Action Alternatives, there would be minor cumulative impact on land use.

4.9.4 Potential Impacts from Alternative F

Alternative F would change land use in this area by constructing a new pond and additional recreational facilities. Increased use to the area surrounding the new pond would result in impacts to ground vegetation by altering pedestrian traffic patterns, possibly requiring periodic revegetation or additional walkways to be installed.

4.10 ENVIRONMENTAL JUSTICE IMPACTS

Impacts to environmental justice have the potential to occur if a Proposed Action took place in a location that discriminates against or would adversely impact low-income and minority populations.

4.10.1 Potential Impacts from the Proposed Action

The Proposed Action would increase recreational opportunities and be available for all Base personnel, thus, this action would not adversely impact either low-income or minority populations.

4.10.2 Potential Impacts from the No Action Alternative

The No Action Alternative would have no impact on low-income or minority populations.

4.10.3 Unavoidable and Cumulative Impacts

The Proposed Action and No Action Alternatives would have no cumulative impact on minority and low-income populations.

4.10.4 Potential Impacts from Alternative F

Alternative F would increase recreational opportunities and be available for all Base personnel, thus, this action would not adversely impact either low-income or minority populations.

5.0 COMPARISON OF ALTERNATIVES

Chapter 4 of the EA provides a comparison of the Proposed Action (Alternative E) and No Action Alternatives. Under both the Proposed Action and Alternative F, air resources would temporarily be impacted by air-blown dust and soil particles, but could be minimized through construction BMPs. However, because of the duration of pond construction, potential air quality impacts would be short-term and localized at either site. Differences in air and noise impacts would exist during pond construction between the Proposed Action and Alternative F. Since the area adjacent to Pow Wow Park is isolated from residential areas, these impacts would be less noticeable. However, pond construction in Alternative F is within a housing area resulting in more noticeable air and noise impacts to its residents. Surface water near Pow Wow Pond would not experience adverse impacts during the construction of a new pond. Thus it would continue to provide fishing opportunities for Base families during construction. However, as mentioned in section 4.2.1, Potential Impacts to Surface Water, precautions would be needed to convey surface water flows away from the proposed pond construction area in Alternative F until the newly created pond could hold water, thus adding to the complexity of selecting this site.

Biological resources may experience minor adverse impacts by displacing wildlife during the construction phase due to a temporary increase in noise and human presence. Direct impacts of pond construction would include increased risk of weed infestation during pond construction and reduced nesting habitat for wildlife when the new pond is filled. The Proposed Action and two Alternatives (D and F) require undesirable fish in Pow Wow Pond be dealt with in the same

manner; by stocking adult size bass to prey on the goldfish present. And Alternatives B and C would also require bass to be restocked in combination with one of the trout species.

Thus, while adverse impacts from the proposed pond construction are possible as is the risk to health and safety resulting from equipment operation, they are expected to be minor and insignificant. Overall, the Proposed Action is expected to result in beneficial impacts on the biological resources and recreational opportunities of the area. No beneficial impacts are predicted for the No Action Alternative.

6.0 MITIGATION MEASURES

The 1978 CEQ regulations for implementing NEPA recognize the following five means of mitigating an environmental impact:

1. Avoidance (No Action)
2. Limitation of Action (Minimization)
3. Restoration of Environment (Remediation)
4. Preservation and Maintenance Operation (Reduction)
5. Replacement (Compensation)

The Proposed Action is not expected to require major mitigating measures. However, proposed measures to mitigate any possible adverse impacts identified as part of this EA are noted below.

6.1 Air Quality

Increased risk to health and safety, mainly to construction workers from inhalation of dust or soil particles would be mitigated by careful management of employees by contractors, as well as using water to limit the amount of particles becoming airborne. All individuals assisting in pond construction would use proper safety equipment to minimize potential hazards and public access would be limited during the construction phase.

6.2 Biological Resources

Direct disturbance from human and vehicle presence would be more than that generated by the routine recreational use and would require mitigation. Direct impacts of the Proposed Action would include removal of surface soils in some areas and the creation of an impoundment. Sport fish would be stocked into the new pond or allowed to drift down to it through the interconnected waterway once activities are completed and the new water body is given time to create a

functioning aquatic system. Insects and other species would also establish themselves through this connection. Crayfish could be reintroduced from Pow Wow Pond, especially if they do not migrate on their own through the connecting waterway. Amphibians such as Northern leopard frogs (*Rana pipiens*) have been detected in Pow Wow Pond and mitigation is not needed under the Proposed Action. If chemical treatment is justified in the future, mitigation may be required to return this species to the pond. However, since this species has been observed in Pow Wow Pond since the chemical treatment in 2005, it's not anticipated that reestablishment efforts would be needed. Survival of the sport fishery and overall health of the current recreational fishery would be enhanced by the Proposed Action. Impacts to wetland areas, ground water, or significant habitat areas are expected to be minimal or absent under the Proposed Action; therefore, no mitigation measures are required or proposed. Thus, the Proposed Action would have long-term beneficial effects on the biological integrity of the Malmstrom AFB recreational fishery.

6.3 Health and Safety

During transportation of the fill material and pond construction, all recommended safety standards would be followed and safety equipment would be utilized to minimize potentials hazards to humans and the environment. In addition, during pond construction, the area would be closed off to public access. The area would be signed and USAF staff would be on-site to prevent public entry. Extra patrols by security personnel during construction should be considered in their routine schedule of surveillance.

6.4 Waste and Storm Water Management

All wastes would be managed in accordance with Montana solid and hazardous waste management requirements and the Clean Water Act. Wastes generated from the Proposed Action (construction debris) would be disposed of in accordance to existing regulations. Surface water would be managed in accordance with the Montana DEQ storm water program. Storm water generated during runoff events flowing into the project area would be re-directed away from the construction site by the series of irrigation ditches already in place.

6.5 Monitoring

During pond construction, the area would be closed off to public access. After construction, the site may remain closed until bare soils along its banks and impoundment are allowed to revegetate. The construction area would be fenced and signed explaining project objectives. USAF security personnel would monitor public entry in the area.

7.0 LIST OF PREPARERS

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8.0 REFERENCES

City of Great Falls Chamber of Commerce. 1999. Great Falls Public Water Supply System. 406/727-1325 and website.

Findlayson, B.J., R.A. Schnick, R.L. Cailteux, L. DeMong, W.D. Horton, W. McClay, C.W. Thompson, and G.J. Tichacek. 2000. Rotenone use in fisheries management: administrative and technical guidelines manual. American Fisheries Society, Bethesda, Maryland.

Hart Crowser, Inc. 2004. Draft Environmental Assessment B Corrosion Control/Aerospace ground equipment facility for Malmstrom Air Force Base, Montana. Seattle, Washington.

Hydrometrics, Inc. 2003. Type A Report for Implementing Biological Survey Recommendations B Pow Wow Pond. Helena, Montana.

Malmstrom Air Force Base (MAFB). 1996. Montana Pollution Discharge Elimination System Storm Water Discharge Permit. Issued by the Montana Department of Environmental Quality to Malmstrom Air Force Base.

MAFB. 1998. Malmstrom Air Force Base Storm Water Pollution Prevention Plan. Prepared by 341 CES/CEVC, Malmstrom AFB and submitted to the Montana Department of Environmental Sciences.

Montana Agricultural Experiment Station. 1982. Soils of Montana. Montana Agricultural Experiment Station, Montana State University and the USDA Soil Conservation Service. Bulletin 744.

Montana Natural Heritage Program. 2009. Report of Threatened and Endangered and Sensitive Species of Plants and Animals in the Vicinity of Malmstrom Air Force Base. Helena, Montana.

Tetra Tech EM Inc. 2000. Draft Environmental Assessment for an Outgrant to the Montana Army National Guard. Malmstrom Air Force Base.

United States Air Force (USAF). 1994. Endangered Species Biological Survey of Malmstrom Air Force Base. Prepared by BioSystems Analysis, Inc.

USAF. 1998. Environmental Assessment of the Proposed Creation of a Rapid Engineer, Deployable, Heavy Operational Repair Squadron, Engineer (RED HORSE) training area at Malmstrom AFB. Prepared by 341 CES/CEVV, Malmstrom AFB.

USAF. 1999. Environmental baseline survey for the proposed land lease site at Malmstrom AFB to the Army National Guard. Prepared by 341 CES/CEV, Malmstrom AFB.

USAF. 2008. 341 Missile Wing, Integrated Natural Resources Management Plan for Malmstrom Air Force Base, EA. Engineering, Science, and Technology. Lincoln, Nebraska.

USAF. 2009. Draft Integrated Cultural Resources Management Plan for Malmstrom Air Force Base. Prepared by 341 CES/CEAN Environmental Flight. Malmstrom Air Force Base, Great Falls, Montana.

U.S. Army Corps of Engineers. 1998. Army National Guard Manual for Compliance with the National Environmental Policy Act of 1969. Prepared for the Army National Guard by the U.S. Army Corps of Engineers and Tetra Tech, Inc.

U.S. Bureau of Census. 2000. Census 2000 State and County Quick Facts. U.S. Census Bureau,
Burlington County, New Jersey.

U.S. Environmental Protection Agency (USEPA). 2003. EPA Restricted Use Pesticide (RUP) Report.

U.S. Fish and Wildlife Service (USFWS). 2002. An Evaluation of the Terrestrial and Aquatic Resources of Malmstrom Air Force Base. Montana Fish and Wildlife Management Assistance Office, Bozeman, Montana.

USFWS. 2004. Environmental Assessment. Eradication of Invasive Fish Species from Pow Wow Pond, Malmstrom Air Force Base. Montana FWMAO, Bozeman, Montana.

USFWS. 2007. Pow Wow Pond, Malmstrom Air Force Base. Annual Progress Report. Montana FWMAO, Bozeman, Montana.

USFWS. 2009. Pow Wow Pond, Malmstrom Air Force Base. Annual Progress Report. Montana FWMAO, Bozeman, Montana.

Western Regional Climate Center (WRCC) website. 1999. (www.wrcc.dri.edu) Desert Research Institute. Reno, Nevada.

Winter, T.J. 2005. Population size, growth, and control of exotic goldfish (*Crassius atratus*) in a small impoundment: implication for managing future invasions. Undergraduate Research Program. University of Minnesota, Duluth, Minnesota.

APPENDIX A

PHOTOGRAPHS OF THE PROJECT AREA

Site of a new pond under the Proposed Action (Alternative E).

Site for a new pond under Alternative F.

APPENDIX B

THREATENED, ENDANGERED AND CANDIDATE SPECIES, IN MONTANA

United States Department of the Interior

FISH AND WILDLIFE SERVICE

ECOLOGICAL SERVICES

MONTANA FIELD OFFICE

585 SHEPARD WAY

HELENA, MONTANA 59601

PHONE (406) 449-5225, FAX (406) 449-5339

THREATENED, ENDANGERED AND CANDIDATE SPECIES IN MONTANA

ENDANGERED SPECIES ACT

ENDANGERED (E) - Any species that is in danger of extinction throughout all or a significant portion of its range.

THREATENED (T) B Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

CANDIDATE (C) B Those taxa for which the Service has sufficient information on biological status and threats to propose to list them as threatened or endangered. We encourage their consideration in environmental planning and partnerships, however, none of the substantive or procedural provisions of the Act apply to candidate species.

EXPERIMENTAL NONESSENTIAL POPULATION (XN) B A population of a listed species reintroduced into a specific more flexible management under the Act.

CRITICAL HABITAT (CH) B The specific area (i) within the geographic area occupied by a listed species, at the time it is listed, on which are found those physical or biological features (I) essential to conserve the species and (ii) that may require special management considerations or protection: and (iii) specific areas outside the geographic area occupied by the species at the time it is listed upon determination that such areas are essential to conserve the species.

THREATENED, ENDANGERED AND CANDIDATE SPECIES IN MONTANA
ENDANGERED SPECIES ACT
March, 2009

Common Name	Scientific Name	Status	Range in Montana
Black-footed Ferret	*Mustela nigripes*	E/XN	Prairie dog complexes; eastern Montana
Gray Wolf	*Canis lupus*	E/XN	Forests; western Montana
Whooping Crane	*Grus americana*	E	Wetlands; migrant eastern Montana
Least Tern	*Sterna antillarum*	E	sandbars and beaches; Missouri and Yellowstone rivers; eastern Montana
Pallid Sturgeon	*Scaphirhynchus albus*	E	Bottom dwelling; Missouri and Yellowstone rivers
White Sturgeon Kootenai River population	*Acipenser transmontanus*	E	Bottom dwelling; Kootenai River
Grizzly Bear	*Ursus arctos horribilis*	T	Alpine/subalpine coniferous forest; western Montana
Water Howellia	*Howellia aquatilis*	T	Wetlands; Swan Valley, Lake and Missoula counties
Ute Ladies'-tresses	*Spiranthes diluvialis*	T	River meander wetlands; Jefferson, Madison, Beaverhead, Gallatin, and Broadwater counties
Spalding's Campion (or "catchfly")	*Silene spaldingii*	T	Open grasslands with rough fescue or bluebunch wheatgrass; Upper Flathead River and Fisher River drainages; Tobacoo Valley
Piping Plover	*Chadadrius melodus*	T CH	Alkalis beaches and sandbars; Missouri River; northeastern Montana Alkali lakes in Sheridan County; riverine and reservoir shorelines in Garfield McCone, Phillips, Richland, Roosevelt, and Valley counties

THREATENED, ENDANGERED AND CANDIDATE SPECIES IN MONTANA
ENDANGERED SPECIES ACT
March, 2009

Common Name	Scientific Name	Status	Range in Montana
Canada Lynx contiguous U.S. populations	*Lynx canadensis*	T CH	 Portions of Flathead and Glacier counties
Bull Trout Columbia River basin and St. Mary - Belly River populations	*Salvelinus confluentus*	T CH	Cold water rivers and lakes; Clark Fork, Flathead, Kootenai, St. Mary and Belly portions of Portions of rivers, streams, lakes, and reservoirs within Deer Lodge, Flathead, Glacier, Granite, Lake, Lewis and Clarke, Lincoln, Mineral, Missoula, Powell, Ravalli, and Sanders counties
Warm spring zaitzevian riffle beetle	*Zaitzevia thermae*	C	warm springs; Gallatin county
Slender (or linearleaf) moonwort	*Botrychium lineare*	C	meadows in conifer forests; Glacier and Lake counties
Yellow-billed cuckoo western population	*Coccyzus americanus*	C	riparian areas with cottonwoods and willows; Populations west of the Continental Divide

APPENDIX C

LIST OF FISH SPECIES CONSIDERED FOR STOCKING BASE PONDS AND WILD FISH TRANSFER PROTOCOL

LIST OF FISH SPECIES CONSIDERED FOR STOCKING BASE PONDS

Common Name	Scientific Name
Brown Trout	*Salmo trutta*
Rainbow Trout	*Oncorhynchus mykiss*
Largemouth Bass	*Micropterus salmoides*
Tiger Muskie	*Esox lucius x Esox masquinongy*
Channel Catfish	*Ictalurus punctatus*

WILD FISH TRANSFER PROTOCOL

TITLE

The transfer of live adult largemouth bass to control undesirable fishes inhabiting the recreational fishery on Malmstrom Air Force Base, Great Falls, Montana.

THE PROCESS

No wild fish may be transported from one body of water in Montana to another body of water in Montana until the proposed transfer has been reviewed as prescribed in Montana's wild fish transfer policy. A request for transfer of wild fish is required to be submitted to Montana Fish, Wildlife and Parks Fish Health Committee for consideration for permitting. Such a transfer requires disease testing from the source population, committee review, and issuance of a fish health certificate.

THE METHOD

The U.S. Fish and Wildlife Service, Montana Fish and Wildlife Conservation Office (FWCO), has identified a site where suitable sized largemouth bass exist in sufficient numbers to satisfy stocking objectives without effecting the donor population. The FWCO will collect largemouth bass from ponds on Lee Metcalf National Wildlife Refuge (NWR) near Stevensville, Montana and transfer them to Malmstrom AFB. Bass will be collected by the most efficient means possible; which may include: angling, trapping, and electroshocking. Captured fish will be identified to species, sexed, and measured to total length and weight. Bass will be separated by sex and 25 of each sex between 12 and 16 inches in length will be selected for transfer. Bass selected for transfer will be held in live cages until loaded into a government sanctioned transport vehicle and driven nonstop to Malmstrom AFB, where they will be immediately stocked into Pow Wow Pond.

The FWCO shall obtain all permits and make all required notifications in order to collect and transport largemouth bass from Lee Metcalf NWR to Malmstrom AFB before fish are collected. During Lee Metcalf NWR's 2009 Bioblitz, disease testing was performed on largemouth bass by the U.S. Fish and Wildlife Service, Bozeman Fish Health Center, resulting in a clean bill of health. A non-hatchery raised fish inhabiting Malmstrom's Pow Wow Pond was also tested and received a clean bill of health. A wild fish transfer permit and associated documentation have been submitted to the Montana's Fish Health Committee for review. Similarly, a fisheries management proposal addressing this transfer has been received, reviewed, and concurred with by Lee Metcalf NWR staff. All actions will be coordinated with Malmstrom AFB and the Montana Department of Fish, Wildlife and Parks prior to fish leaving Lee Metcalf NWR.

APPENDIX D

HEALTH AND SAFETY PLAN FOR ROTENONE APPLICATION

U.S. Air Force/U.S. Fish and Wildlife Service
Health and Safety Plan for Rotenone Application
September 2009

I. Project Title:

Eradication of Invasive Fish Species from Ponds on Malmstrom Air Force Base

II. Description of Project:

The subject project is a cooperative effort between the USAF and USFWS to eradicate illegally introduced, invasive fish inhabiting Base ponds with the piscicide rotenone. Use of rotenone is preferred to ensure a complete kill under the conditions found in within these ponds. The USFWS will provide all labor, equipment, and materials necessary to remove invasive fish species such as goldfish and white suckers. Rotenone will be applied under the direction of Fish and Wildlife Service personnel certified as pesticide applicators by the State of Montana. To accomplish a complete kill, a 2.5% synergized rotenone solution will be applied to the surface of a pond and dripped into any inflowing water.

III. Project Timetable:

Application of the rotenone will occur in the fall to ensure all fish have spawned, all fish eggs have hatched, and the pond water is at minimum level. It is anticipated that two work days would be required to complete the rotenone treatment per pond.

IV. Project Organization, Management, and Oversight:

Applicator Supervision

The use of formulated rotenone products will be supervised on-site by at least one person who has Montana Department of Agriculture certification as a piscicide applicator. These supervisors will have the authority to start and stop the rotenone application and will be well versed in all federal and state regulatory requirements regarding the safe and legal use of rotenone and applicator safety. Personnel involved in the application would be composed of staff from the USFWS Montana Fish and Wildlife Conservation Office, with Robbin Wagner acting as the on-site supervisor.

Certified Piscicide Applicator: **Robbin Wagner, FWS**
USAF Supervision/Site Security: **Rudy Verzuh, USAF, CES/CEV**

V. Operational Procedures:

To accomplish a complete kill, a 2.5% synergized rotenone solution would be applied to the surface of a pond and dripped into any inflowing water. Application of rotenone will only be performed when the water level of the pond is well below the outlet so there is no chance of rotenone treated water escaping from the pond. Based on the water depth and conditions found in Pow Wow Pond during the 2005 treatment, 40 gallons of chemical would be required.

Rotenone Transport

The rotenone will be transported from Lewistown to Malmstrom AFB in a single truck. The truck will also be equipped with two spill response kits and two 40 pound bags of absorbent. Each person in the transport vehicle will be equipped with PPE and will be briefed on emergency procedures in case of a spill during transport.

Liquid Formulation Hazards

The liquid rotenone formulation will be applied as a 10% dilution with water. The greatest potential for applicator exposure occurs when the concentrate is removed from its original container and mixed with water. Hazard to the applicator from concentrated rotenone liquid is significantly reduced by using proper mixing and loading procedures. Liquid formulations can be removed from original containers by hand pouring or pumping. Hand pouring greatly increases applicator hazard. Pumping the concentrated liquid from its container into the measuring equipment is preferred.

Central Staging Area

A central staging area will be established in the nearest parking lot where there is an unlimited water source (hydrant) for both drinking and washing. The staging area will be equipped with liquid soap, towels, extra coveralls and rubber gloves, extra eyewash bottles, extra respirators and cartridges, and a complete change of clothing for each worker. The staging area will have copies of all material safety data sheets and product labels. Personnel may keep snack items, lunch, refreshments and personal items in vehicles in the central staging area.

Application

Upon arrival on the day of application, the first order of business will be to launch and moor the application boat. The central staging area will be completely assembled and all involved personnel will receive a final briefing. Personal protective equipment (PPE) will be distributed and donned by all application personnel. The rotenone containers will be off-loaded and placed at the mixing station located on level ground near the boat mooring. All rotenone will be applied as a 10% dilution (using pond water to dilute). All application containers will be labeled with the specific mixing ratio.

The edges of the pond will be treated first using a combination of backpack sprayers and plastic watering cans. Those areas of the pond perimeter that can be accessed from the shore will be completed first. Areas of the pond perimeter that cannot be accessed from shore will be treated from the boat using a backpack sprayer. After completion of pond perimeter treatment, the

remainder of the rotenone will be applied using a boat equipped with a holding tank and siphon boat bailer. Rotenone solution will be applied from the boat in concentric circles lapping the pond perimeter in a clockwise direction in increasingly smaller circles to the center of the pond until all rotenone is dispersed.

All concentrated rotenone containers will be triple-rinsed and the resultant fluid re-applied to the pond. The empty containers will be transported back to Lewistown, crushed, and disposed of in a safe manner. All application equipment will be triple-rinsed and re-applied to the pond. All PPE will be triple rinsed and/or washed. All disposable and unusable PPE will be double-bagged and transported back to Lewistown and disposed of.

Area Closure

The EPA has determined that the use of rotenone for fish control does not present a risk of unreasonable adverse effects to humans and the environment. However, both during and after application, the project area will be closed off to public access. The area treated will be signed and USAF personnel will prohibit public entry for approximately 24 hours after application is complete. For a 24 hour period beginning at the start of operations at the pond, the area will be marked off by USAF personnel with traffic cones and/or barriers and identified as off limits. During rotenone application (the time when there is risk of exposure to unprotected personnel) USAF personnel will be on scene to monitor access. Installation security forces will check the pond on a regular basis with their patrols for a 24 hour period beginning from the time operations start at the pond.

Safety Equipment

The U.S. Fish and Wildlife Service requires that all personnel who handle opened containers of rotenone or participate in the application of rotenone use the following personal protective equipment (PPE): (a) coveralls (disposable Tychem); (b) eye and face protection provided by full-face, air-purifying respirators; (c) rubber boots (hip boots and personal floatation devices will be required for boat operators); and (d) rubber gloves. All equipment must be clean and in good repair at the start of each workday.

Personnel working with (mixing, loading, or applying) undiluted liquid formulations of rotenone will use air-purifying respirators with organic vapor-removing cartridges. Personnel required to wear respirators must be provided with respiratory protection training that includes instruction on how to properly fit and test a respirator. Respirator cartridges should be changed as needed. Extra respirators and cartridges will be available at the central staging area.

Personnel mixing and/or applying undiluted formulations of rotenone will be provided with premixed personal eyewash bottles that will be with each worker at all times. Personnel handling rotenone will be issued two sets of coveralls and rubber gloves. Ripped clothing or damaged equipment must be replaced as soon as possible.

VI. Communications Plan:

Two cellular telephones will be available on-site for communications purposes. The location of the nearest pay phone will be posted and communicated during briefings. Important contact numbers are listed below:

Benefis Healthcare B Emergency 406-455-5200
Benefis Healthcare B Non-emergency 406-455-3900
Rudy Verzuh 406-731-6167
Robbin Wagner cell phone 406-579-1013
Montana Fish and Wildlife Conservation Office 406-585-9010

VII. Emergency Response Plan:

A briefing will be held for all personnel involved in the operation including transportation and application of rotenone. This briefing will include outlining emergency procedures and defining the roles of personnel when responding to an emergency.

Any personnel that suspects they have been made ill by rotenone will immediately report to the certified project supervisor. If necessary, the person will make their way or be assisted to the central staging area, remove their work clothing, rinse affected area at the hydrant, and dress in clean work clothing and/or PPE.

In the event of rotenone exposure to the eyes while away from the central staging area, the person's eyes should be immediately flushed with the personal eyewash bottles on their person. They should then immediately be assisted to the central staging area and have their eyes flushed with large amounts of water for at least 15 minutes. The person will be attended to by the certified project supervisor and taken to the appropriate medical care facility, Benefis Healthcare-East Campus. Copies of the product labels and material safety data sheets will be available at the central staging area for the formulated rotenone products and will be provided to any medical professionals as needed.

VIII. Signatures:

Prepared By: _____ **Date:** _____

Title: _____

Reviewed By: _____ **Date:** _____

Title: _____

Reviewed By: _____ **Date:** _____

Title: _____

Reviewed By: _____ **Date:** _____

Title: _____

Approved By: _____ **Date:** _____

Title: _____

APPENDIX E

MATERIAL SAFETY DATA SHEET
AND
ROTENONE SPECIMEN LABEL

Product: 655-421 Prentox7 Synpren-FishJ Toxicant

Material Safety Data Sheet

U.S. Department of Labor (OSHA 29 CFR 1910.1200)

Manufacturer's Name: Prentiss Incorporated
C. B. 2000
Floral Park, NY 11001
Telephone Number: (516) 326-1919

Section 1: Chemical Identification

Product: 655-421 **Prentox7 Synpren-FishJ Toxicant**

EPA Signal Word: DANGER

Active Ingredients (%):	Rotenone (2.5%)	(CAS # 83-79-4)
	Other Cube Resins (5%)	N/A
	Piperonyl Butoxide Technical (2.5%)	(CAS # 51-03-6)
Chemical Names:	Rotenone B N/A	
	Piperonyl Butoxide Technical (Butylcarbityl) (6-Propylpiperonyl) ether	
Chemical Class:	Mixture, a.i.=s, rotenone and piperonyl butoxide technical	

Section 2: Composition/ Information On Ingredients

Material:	OSHA PEL	ACGIH TLV	NTP/IARC/OSHA Other
Carcinogen			
Rotenone	(TWA) 5 mg/ M3	(STEL) 10 mg/M3 (TWA) 5 mg/M3	No/No/No
Other associated cube resins	Not Est.	Not Est.	
Piperonyl ButoxideTechnical	Not Est.	Not Est.	No/No/No

Xylene Range Aromatic Solvent Supplier recommendation 100 ppm

(CAS # 64742-95-6)

(Not to exceed 90%)

Contains the following ingredients, by weight (typical):

1,2,4-Trimethyl Benzene (CAS # 95-63-6)	32.0	(TWA) 25 ppm
Mixed Xylenes (CAS # 1330-20-7)	3.0	(TWA) 100 ppm
Cumene (CAS # 98-82-8)	1.5	(TWA) 50 ppm
Ethyl Benzene (CAS # 100-41-4)	0.5	(TWA) 100 ppm
Emulsifier #1 (CAS # N/A) N/D	N/D	
Emulsifier #2 (CAS # N/A) N/D	N/D	

Section 3: Hazards Identification

Clear liquid with mild odor. Fatal if inhaled. May be fatal if swallowed. Harmful if absorbed through skin. Causes substantial but temporary eye injury. Causes skin irritation. This pesticide is extremely toxic to fish.

Potential Health Effects:

Primary Routes of Entry: Inhalation, ingestion, skin and eye contact.

Health Hazards (Acute and Chronic): Causes mucous membrane irritation. Chronic exposure can cause damage to liver and/or kidneys. May be fatal if swallowed. May cause eye injury. Causes skin irritation. Do not get in eyes, on skin or on clothing. Toxicity of other components: This product contains a Xylene Range Aromatic Solvent composed of xylenes, ethylbenzenes and aromatic naphtha containing trimethylbenzenes. Inhalation of solvent vapors at high concentrations can cause central nervous system depression, respiratory tract irritation, asphyxiation, cardiac stress, and coma. Exposure to extremely high levels of xylenes may cause kidney or liver damage.
Signs and Symptoms of Overexposure: Can cause skin irritation. Ingestion or inhalation can cause numbness, nausea, vomiting and tremors.
Medical Conditions Generally Aggravated by Exposure: None known.

Section 4: First Aid Measures

If swallowed, call a physician or Poison Control Center. Do not induce vomiting. This product contains aromatic petroleum solvent. Aspiration may be a hazard. Promptly drink a large quantity of milk, egg white, and gelatin solution, or if these are not available, water. Avoid alcohol.
If inhaled, remove victim to fresh air. If not breathing, administer artificial respiration, preferably by mouth to mouth. Get medical attention.
If on skin, wash with plenty of soap and water. Get medical attention if irritation persists.
If in eyes, flush eyes with plenty of water. Get medical attention if irritation persists.

Section 5: Fire Fighting Measures

Fire and Explosion

Flash Point (Method Used): 105o F. Closed cup.

Flammable Limits: LEL: 1.9 UEL: 12.6 (Solvent - approximate)

NFPA Hazard Ratings: Health: 2 **Flammability:** 2 **Reactivity:** 0

Extinguishing Media: CO2, foam, dry chemical, or water spray.
Special Fire Fighting Procedures: Do not inhale smoke. Use self-contained breathing apparatus and protective clothing. This product is extremely toxic to fish, and is toxic to birds and other wildlife, prevent spread of contaminated runoff.

Unusual Fire and Explosion Hazards: When heated to decomposition, product emits acrid smoke and fumes.

Flammability Classification/Rating:

NFPA/OSHA Class: II

NFPA Rating (Fire): 2

Section 6: Accidental Release Measures

Wear protective equipment, as required, to prevent contact with product or its vapors. Cover the spilled material with generous amounts of absorbent material, such as clay, diatomaceous earth, sand or sawdust. Sweep the contaminated absorbent onto a shovel and put the sweepings into a salvage drum. Dispose of wastes as below. Place any leaking container into a similar drum or glass container. Mark the drum or container with name of product, ingredient statement, precautionary statements and signal word. Contact us for replacement label. This product is extremely toxic to fish. Fish kills are expected at recommended rates. Keep it out of lakes, streams or ponds except under use conditions.

Section 7: Handling and Storage

Do not contaminate water, food or feed by storage or disposal. Store in a dry place away from temperature extremes. Avoid inhalation of vapors. Harmful if swallowed, inhaled or absorbed through skin. Avoid contact with skin. Wear clean protective clothing.

Other precautions: Periodically inspect stored materials.

Section 8: Exposure Controls/Personal Protection

Respiratory protection: Mixers and handlers: Do not inhale. Use NIOSH certified respirator for organic vapor protection.

Ventilation:

Local Exhaust: As required to meet TLV.

Special: Not applicable.

Mechanical: As required to meet TLV.

Other: Not applicable.

Protective Gloves: Chemical resistant.

Eye Protection: Safety glasses, face shield or goggles.

Other protective clothing or equipment: Wear long pants, long sleeved shirt or other body covering clothes. Avoid skin or eye contact.

Work/Hygienic practices: Wash thoroughly after handling and before eating or smoking. Remove contaminated clothing and wash thoroughly before reuse.

Section 9: Physical and Chemical Properties

Appearance:	Amber Liquid
Odor:	Aromatic Solvent Odor
Boiling Point:	N/D
Specific Gravity (H2O = 1):	0.8964
Vapor Pressure (mmHg):	N/D
Melting Point:	N/D
Vapor Density (Air = 1):	N/D

Evaporation Rate (Butyl Acetate = 1): N/D

Solubility in Water: Emulsifies.

Section 10: Stability and Reactivity

Stability: Stable.

Conditions to avoid for stability: None.

Incompatibility: Strong acids and oxidizers.

Hazardous Decomposition or Byproducts: CO, CO2

Hazardous Polymerization: Will not occur.

Conditions to avoid for Hazardous Polymerization: None.

Section 11: Toxicological Information

Acute Toxicity/Irritation Studies:

(The following data were developed with Synpren-Fish)

Ingestion: Oral LD50 147 mg/Kg (Rat B female) (Moderately toxic)

704 mg/Kg (Rat B male) (Slightly toxic)

561 mg/Kg (Rat B overall) (Slightly toxic)

Dermal: >2020 mg/Kg (Rabbit) (Slightly toxic)

Inhalation: 4-hour LC50 0.041 mg/l. (Female Rat) (Highly toxic)

4-hour LC50 0.059 mg/l. (Male Rat) (Highly toxic)

4-hour LC50 0.049 mg/l. (Rat B overall) (Highly toxic)

Eye Contact: Moderately irritating (Rabbit)

Skin Contact: Moderately irritating (Rabbit)

Skin Sensitization: Non-sensitizing (Guinea Pig)

(The following data were developed with rotenone technical and piperonyl butoxide technical)

Mutagenic Potential: Neither ingredient was mutagenic when tested.

Reproductive Hazard Potential: Neither ingredient had reproductive effects when tested

Chronic/Subchronic Toxicity Studies:

Cancer Information: A statistically significant increase in the number of benign liver tumors appeared in mice fed piperonyl butoxide technical at doses which far exceed any anticipated daily human intake. Independent industry toxicology experts who have reviewed the data agree that the findings of the study do not indicate a health risk to human beings. Rotenone was not carcinogenic when tested in rats and mice.

Toxicity of Other Components:

Petroleum solvent: The supplier reports that inhalation of high vapor concentrations (over 1,000 ppm) may cause nervous system effects such as headaches, dizziness, anesthesia and respiratory tract irritation.

Surfactant: Causes severe eye irritation, which could lead to permanent eye damage. Prolonged or repeated skin contact may cause discomfort and local redness. Mist can irritate the respiratory tract, experienced as nasal discomfort and discharge with chest pain and coughing.

Target Organs: Eyes, skin, respiratory tract.

Section 12: Ecological Information

Summary of Effects: This product is extremely toxic to fish. Fish kills are expected at recommended rates. Consult your State Fish and Game Agency before applying this product to public waters to determine if a permit is needed for such an application. Do not contaminate untreated water when disposing of equipment washwaters.

Section 13: Disposal Considerations

Disposal: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container disposal: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities.

Section 14: Transport Information

DOT Classification: Pesticides, liquid, toxic, flammable, n.o.s. (Rotenone, petroleum naphtha)

Hazard Class: 6.1,PG I

Subsidiary hazard class: 3

DOT Identification Number: UN2903

DOT Shipping Label: Poison and/or Toxic

Note: for transport purposes (49 CFR Part 173.132), the calculated 1-hour LC50 (Rat, overall) is: 0.196 mg/L

Section 15: Regulatory Information

SARA Title III Classification:

Section 311/312:

Acute health hazard

Fire hazard

Section 313 Chemicals:

Piperonyl Butoxide Technical (2.5%) (CAS # 51-03-6)

Xylene Range Aromatic Solvent (% Conf.) (CAS # 64742-95-6)

(Not to exceed 90%)

Contains the following SARA listed ingredients, by weight (typical):

1,2,4-Trimethyl Benzene (CAS # 95-63-6)	32.0	(TWA) 25 ppm
Mixed Xylenes (CAS # 1330-20-7)	3.0	(TWA) 100 ppm
Cumene (CAS # 98-82-8)	1.5	(TWA) 50 ppm
Ethyl Benzene (CAS # 100-41-4)	0.5	(TWA) 100 ppm

This product contains a toxic chemical or chemicals subject to the reporting requirements of Section 313 of Title III and of 40 CFR 372. Any copies or redistribution of this MSDS must include this notice.

Proposition 65: This product does not contain any chemical which is known to the State of California to cause cancer or birth defects or other reproductive harm.

CERCLA Reportable Quantity (RQ): None.

RCRA Classification: Ignitable.

TSCA Status: Registered pesticide, exempt from TSCA regulation. All ingredients are on the TSCA inventory.

Other: Rotenone

Illinois toxic substance

Massachusetts Hazardous Substance

New Jersey Special Health Hazardous Substance

Pennsylvania Workplace Hazardous Substance

Section 16: Other Information

NFPA Hazard Ratings: Health:	3	0	Least	
Flammability:	2	1	Slight	
Reactivity:	0	2	Moderate	
		3	High	
		4	Severe	

Date Prepared: September 18, 2000

Supersedes: August 10, 2000

Reason: Revised section 15.

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein.

RESTRICTED USE PESTICIDE

DUE TO AQUATIC AND ACUTE INHALATION TOXICITY

For retail sale to, and use only by, Certified applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's certification

SYNPREN-FISH TOXICANT

Liquid-Emulsifiable

***For Control of Fish in Lakes, Ponds, Reservoirs and Streams**

ACTIVE INGREDIENTS:	
Rotenone	2.5% w/w
Other Associated Resins	5.0%
Piperonyl Butoxide, Technical*	2.5%
INERT INGREDIENTS: **	90.0%
TOTAL:	100.0%

*Equivalent to 2.0% [Butylcarbityl] [6-propylpiperonyl] ether and 0.5% related compounds.

**This product contains aromatic petroleum solvents.

PRENTOX® - Registered Trademark of Prentiss Incorporated

KEEP OUT OF REACH OF CHILDREN

DANGER – POISONOUS

See Additional Precautionary Statements Below.

FIRST AID

Have product container or label with you when obtaining treatment advice.

If swallowed	• Call a poison control center, doctor, or the National Pesticide Information Center at 1-800-858-7378 immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by the poison control center or doctor.
If on skin or clothing	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center, doctor, or the National Pesticide Information Center at 1-800-858-7378 immediately for treatment advice.
If inhaled	• Move person to fresh air. • If person is not breathing, call an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. • Call a poison control center, doctor, or the National Pesticide Information Center at 1-800-858-7378 immediately for treatment advice.
If in eyes	• Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center, doctor, or the National Pesticide Information Center at 1-800-858-7378 immediately for treatment advice.

For information on this pesticide product (including health concerns, medical emergencies, or pesticide incidents), call the National Pesticide Information Center at 1-800-858-7378.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

Fatal if inhaled. May be fatal if swallowed. Harmful if absorbed through skin. Causes substantial but temporary eye injury. Causes skin irritation. Do not breathe spray mist. Do not get in eyes, on skin or on clothing. Wear goggles or safety glasses. When working with undiluted product, wear either a respirator with an organic-vapor-removing cartridge with a prefilter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C), or a canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G), or a NIOSH approved respirator with an organic vapor (OV) cartridge or canister with any R, P or HE prefilter. Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco. Remove contaminated clothing and wash before reuse.

ENVIRONMENTAL HAZARDS

This pesticide is extremely toxic to fish. Fish kills are expected at recommended rates. Consult your State Fish and Game Agency before applying this product to public waters to determine if a permit is needed for such an application. Do not contaminate untreated water when disposing of equipment washwaters.

CHEMICAL AND PHYSICAL HAZARDS

Combustible mixture. Flash point of this formulation is 115° F. DO NOT USE OR STORE NEAR HEAT OR OPEN FLAME.

E.P.A. REG. NO. 655-421 **5/01** **E.P.A. EST. NO. 655-GA-1**

Manufactured by:

PRENTISS INCORPORATED

Plant: Kaolin Road, Sandersville, GA 31082

Office: C.B. 2000, Floral Park, NY 11002-2000

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

Storage: Store only in original containers, in a dry place inaccessible to children and pets. Prentox Synpren-Fish Toxicant will not solidify nor show any separation at temperatures down to 40° F and is stable for a minimum of one year when stored in sealed drums at 70° F.

Pesticide Disposal: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions contact your state pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Disposal: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

SAMPLE

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

General Information

Prentox Synpren-Fish Toxicant is a specially formulated product containing synergized rotenone, to be used in fisheries management for the eradication of fish from lakes, ponds, reservoirs and streams. Since such factors as pH, temperature, depth and turbidity will change effectiveness, use this product only at locations, rates, and times authorized and approved by appropriate state and federal fish and wildlife agencies. Rates must be within the range specified on the label.

Properly dispose of unused product. Do not use dead fish for food or feed.

Do not use water treated with rotenone to irrigate crops or release within 1/2 mile upstream of a potable water or irrigation water intake in a standing body of water such as a lake, pond or reservoir.

RE-ENTRY STATEMENT: Do not allow swimming in rotenone-treated water until the application has been completed and all pesticide has been thoroughly mixed into the water according to labeling instructions.

For Use in Ponds, Lakes and Reservoirs

The actual application rates and concentrations of rotenone needed to control fish will vary widely, depending on the type of use (e.g., selective treatment, normal pond use, etc.) and the factors listed above. The table below is a general guide for the proper rates and concentrations. Prentox Synpren-Fish Toxicant disperses readily in water both laterally and vertically, and will penetrate below the thermocline in thermally stratified bodies of water.

Computation of Acre-Feet: An acre-foot is a unit of volume of a body of water having the area of one acre and the depth of one foot. To determine acre feet in a given body of water, make a series of transects across the body of water taking depths with a measured pole or weighted line. Add the soundings and divide by the number made to determine the average depth. Multiply this average depth by the total surface area in order to determine the acre-feet to be treated. If number of surface acres is unknown, contact your local Soil Conservation Service, which can determine this from aerial photographs.

Amount of Prentox Synpren-Fish Toxicant Needed for Specific Uses: To determine the approximate number of gallons of Prentox Synpren-Fish Toxicant (2.5% Rotenone) needed, find your "Type of Use" in the first column of the table below, and then divide the corresponding numbers in the third column, "Number of Acre-Feet Covered by One Gallon" into the number of acre-feet in your body of water.

General Guide to the Application Rates and Concentrations of Rotenone Needed to Control Fish in Lakes, Ponds and Reservoirs[1]

Type of Use	Parts Per Million		Number of Acre-Feet Covered by One Gallon
	Synpren-Fish Toxicant	Active Rotenone	
Selective Treatment	0.20 to 0.25	0.005 to 0.007	15 to 12
Normal Pond Use	1.0 to 2.0	0.025 to 0.050	3.0 to 1.5
Remove bullheads or carp	2.0 to 4.0	0.050 to 0.100	1.5 to 0.75
Remove bullheads or carp in rich organic ponds	4.0 to 8.0	0.100 to 0.200	0.75 to 0.38
Preimpoundment treatment above dam	6.0 to 10.0	0.150 to 0.250	0.50 to 0.30

[1] Adapted from Kinney, Edward. 1965. Rotenone in Fish Pond Management. USDI Washington, D.C. Leaflet FL-576

Pre-Mix and Method of Application: Pre-mix with water at a rate of one gallon Prentox Synpren-Fish Toxicant to 10 gallons of water. Uniformly apply over water surface or bubble through underwater lines.

Detoxification: Prentox Synpren-Fish Toxicant treated waters detoxify under natural conditions within one week to one month depending upon temperatures, alkalinity, etc. Rapid detoxification can be accomplished by adding chlorine or potassium permanganate to the water at the same rate as Prentox Synpren-Fish Toxicant in parts per million, plus enough additional to meet the chlorine demand of the untreated water.

Removal of Taste and Odor: Prentox Synpren-Fish Toxicant treated waters do not retain a detectable taste or odor for more than a few days to a maximum of one month. Taste and odor can be removed immediately by treatment with activated charcoal at a rate of 30 ppm for each 1 ppm Prentox Synpren-Fish Toxicant remaining. (Note: As Prentox Synpren-Fish Toxicant detoxifies, less charcoal is required.)

Restocking After Treatment: Wait 2 to 4 weeks after treatment. Place a sample of fish to be stocked in wire cages in the coolest part of the treated waters. If the fish are not killed within 24 hours, the water may be restocked.

Use in Streams Immediately Above Lakes, Ponds, and Reservoirs

The purpose of treating streams immediately above lakes, ponds and reservoirs is to improve the effectiveness of lake, pond and reservoir treatments by preventing target fish from moving into the stream corridors, and not to control fish in streams per se. The term "immediately" means the first available site above the lake, pond or reservoir where treatment is practical, while still creating a sufficient barrier to prevent migration of target fish into the stream corridor.

In order to completely clear a fresh water aquatic habitat of target fish, the entire system above or between fish barriers must be treated. See the use directions for streams and rivers on this label for proper application instructions.

In order to treat a stream immediately above a lake, pond or reservoir, you must: (a) select the concentration of active rotenone, (b) compute the flow rate of the stream, (c) calculate the application rate, (d) select an exposure time, (e) estimate the amount of product needed, (f) follow the method of application. To prevent movement of fish from the pond, lake or reservoir, stream treatment should begin before and continue throughout treatment of pond, lake or reservoir until mixing has occurred.

1. Concentration of Active Rotenone:

Select the concentration of active rotenone based on the type of use from those listed on the table. Example: If you select "normal pond use" you could select a concentration of 0.025 part per million.

2. Computation of Flow Rate for Stream:

Select a cross section of the stream where the banks and bottom are relatively smooth and free of obstacles. Divide the surface width into 3 equal sections and determine the water depth and surface velocity at the center of each section. In slowly moving streams, determine the velocity by dropping a float attached to 5 feet of loose, monofilament fishing line. Measure the time required for the float to move 5 feet. For fast-moving streams, use a longer distance. Take at least three readings at each point. To calculate the flow rate from the information obtained above, use the following formula:

$$F = \frac{Ws \times D \times L \times C}{T}$$

where F = flow rate (cubic feet/second), Ws = surface width (feet), D = mean depth (feet), L = mean distance traveled by float (feet), C = constant (0.8 for rough bottoms and 0.9 for smooth bottoms), and T = mean time for float (sec.).

3. Calculation of Application Rate:

In order to calculate the application rate (expressed as gallons/second), you convert the rate in the table (expressed as gallons/acre-feet), to gallons per cubic feet and multiply by the flow rate (expressed as cubic feet/second). Depending on the size of the stream and the type of equipment, the rate could be expressed in other units, such as ounces/hour, or cc/minute. The application rate for the stream is calculated as follows:

$$R_s = R_p * C * F$$

where R_s = application rate for stream (gallons/second), R_p = application rate for pond (gallons/acre-feet), C = 1 acre foot/43560 cubic feet, and F = flow rate of the stream (cubic feet/second).

4. Exposure Time:

The exposure time would be the period of time (expressed in hours or minutes) during which Prentox Synpren-Fish Toxicant is applied to the stream in order to prevent target fish from escaping from the pond into the stream corridor.

5. Amount of Product:

Calculate the amount of product for a stream by multiplying the application rate for streams by the exposure time.

$$A = R_s * H$$

where A = the amount of product for the stream application, R_s = application rate for stream (gallons/second), and H = the exposure time expressed in seconds. require major deviation from these use directions a Special Local Need 24(c) registration should be obtained from the state.

Before applications of Prentox Synpren-Fish Toxicant can be made to streams and rivers, authorization must be obtained from State or federal Fish & Wildlife agencies. Since local environmental conditions will vary, consult with the state Fish & Wildlife agency to ensure the method and rate of application are appropriate for that site.

Contact the local water department to determine if any water intakes are (within one mile) down flow of the section of stream, river or canal to be treated. If so, coordinate the application with the

For Use in Streams and Rivers

Only state or federal Fish & Wildlife personnel or professional fisheries biologists under the authorization of state or federal Fish & Wildlife agencies are permitted to make applications of Prentox Synpren-Fish Toxicant for control of fish in streams and rivers. Informal consultation with Fish& Wildlife personnel regarding the potential occurrence of endangered species in areas to be treated should take place. Applicators must reference Prentiss Incorporated's Prentox Synpren-Fish Toxicant Stream and River Use Monograph before making any application to streams or rivers.

Warranty Statement: Our recommendations for the use of this product are based upon tests believed to be reliable. The use of this product being beyond the control of the manufacturer, no guarantee, expressed or implied, is made as to the effects of such or the results to be obtained if not used in accordance with directions or established safe practice. The buyer must assume all responsibility, including injury or damage, resulting from its misuse as such, or in combination with other materials. **PRENTOX® SYNPREN-FISH TOXICANT**

STREAM AND RIVER MONOGRAPH

USE IN STREAMS AND RIVERS

The following use directions are to provide guidance on how to make applications of Prentox Synpren-Fish Toxicant to streams and rivers. The unique nature of every application site could require minor adjustments to the method and rate of application. Should these unique conditions

water department to make sure the intakes are closed during treatment and detoxification.

Application Rates and Concentration of Rotenone

Slow Moving Rivers: In slow moving rivers and streams with little or no water exchange use instructions for ponds, lakes and reservoirs.

Flowing Streams and Rivers: Apply rotenone as a drip for 4 to 8 hours to the flowing portion of the stream. Multiple application sites are used along the length of the treated stream, spaced approximately 1/2 to 2 miles apart depending on the water flow travel time between sites. Multiple sites are used because rotenone is diluted and detoxified with distance. Application sites are spaced at no more than 2 hours or at no less than 1 hour travel time intervals; this assures that the treated stream remains lethal to fish for a minimum of 2 hours. A non-toxic dye such as Rhodamine-WT® or fluorescein can be used to determine travel times. Cages containing live fish placed immediately upstream of the downstream application sites can be used as sentinels to assure that lethal conditions exist between sites.

Apply rotenone at each application site at a concentration of 0.5 to 2.0 parts per million of Prentox Synpren-Fish Toxicant. The amount of Prentox Synpren-Fish Toxicant needed at each site is dependent on stream flow (see Computation of Flow Rate for Stream).

Application of Undiluted Material

Prentox Synpren-Fish Toxicant can drain directly into the center of the stream at a rate of 0.85 to 2.4 cc per minute for each cubic foot per second of stream flow. Flow of undiluted Prentox Synpren-Fish Toxicant into the stream should be checked at least hourly. This is equivalent to from 0.5 to 2.0 ppm Prentox Synpren-Fish Toxicant, or from 0.012 to 0.050 ppm rotenone.

Back-water, stagnant and spring areas of streams should be sprayed by hand with a 10% v/v solution of Prentox Synpren-Fish Toxicant in water to assure a complete coverage.

Calculation of Application Rate:

$$X = F (1.692 B)$$

where X = cc per minute of Prentox Synpren-Fish Toxicant to the stream F = the flow rate (cu. ft/sec) (see *Computation of Flow Rate for Stream* section of the label) and B = parts per million desired concentration of Prentox Synpren-Fish Toxicant.

Total Amount of Product Needed for Treatment: Streams should be treated for 4 to 8 hours in order to clear the treated section of stream of fish. To determine the total amount of Prentox Synpren-Fish Toxicant required, use the following equation:

$$Y = X(0.0158C)$$

Y = gallons of Prentox Synpren-Fish Toxicant required for the stream treatment, X = cc per minute of Prentox Synpren-Fish Toxicant applied to the stream, C = time in hours of the stream treatment.

Application of Diluted Material

Alternatively, for stream flows up to 25 cubic feet per minute, continuous drip of diluted Prentox Synpren-Fish Toxicant at 80 cc per minute can be used. Flow of diluted Prentox Synpren-Fish Toxicant into the stream should be checked at least hourly. Use a 5 gallon reservoir over a 4 hour period, a 7.5 gallon reservoir over a 6 hour period, or a 10 gallon reservoir over an 8 hour period. The volume of the reservoir can be determined from the equation:

$$R = H * 1.25$$

where R = the volume of the reservoir in gallons, and H = the duration of the application in hours.

The volume of Prentox Synpren-Fish Toxicant diluted with water in the reservoir is determined from the equation:

$$X = Y(102\ F)H$$

where X = the cc of Prentox Synpren-Fish Toxicant diluted to 5 gallons, Y = parts per million desired concentration of Prentox Synpren-Fish Toxicant, F = the flow rate (cubic feet/second), H = the duration of the application (hours).

For flows over 25 cubic feet per minute, additional reservoirs can be used concurrently. Back-water, stagnant and spring areas of streams should be sprayed by hand with a 10% v/v/ solution of Prentox Synpren-Fish Toxicant in water to assure a complete coverage.

Detoxification

To limit effects downstream, detoxification with potassium permanganate can be used at the downstream limit of the treated area. Within 1/2 to 2 miles of the furthest downstream Prentox Synpren-Fish Toxicant application site, the rotenone can be detoxified with a potassium permanganate solution at a resultant stream concentration of 2 to 4 parts per million, depending on rotenone concentration and permanganate demand of the water. A 2.5% (10 pounds potassium permanganate to 50 gallons of water) permanganate solution is dripped in at a continuous rate using the equation:

$$X = Y(70\ F)$$

where X = cc of 2.5% permanganate solution per minute, Y = ppm of desired permanganate concentration, and F = cubic feet per second of stream flow.

Flow of permanganate should be checked at least hourly. Live fish in cages placed immediately above the permanganate application site will show signs of stress signaling the need for beginning detoxification. Detoxification can be terminated when replenished fish survive and show no signs of stress for at least four hours.

Detoxification of rotenone by permanganate requires between 15 to 30 minutes contact time (travel time). Cages containing live fish can be placed at these downstream intervals to judge the effectiveness of detoxification . Water temperature of less than 50° F detoxification may be retarded, requiring a longer contact time.

SPECIMEN